ESSAYS IN CORPORATE FINANCE AND CORPORATE MANAGEMENT

BY

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DISSERTATION

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ABSTRACT

This dissertation contains two chapters that study corporate cash holdings and corporate management. Below are the individual abstracts for each chapter.

Chapter 1: Easy Come, Easy Go: Cheap Cash and Bad Corporate Decisions

This chapter investigates the relationship between the sources of a firm's cash reserves and its investments decisions. I explore the information on the cash flow statement to create the first dataset that organizes firms' cash holdings by whether it comes from: Financing, Operating or Investment activities. This dataset allows me to empirically revisit the free cash flow hypothesis by separating what is actually free cash from what it is not. I find that the overspending evidence previously associated to firms with large cash holdings are driven by firms with high reserves coming from operations. My evidence is consistent with theories of the disciplinary effects of external financing, however it is inconsistent with agency explanations of the behavior of firms with large cash reserves. As an alternative explanation to agency I argue that the manager's perception of the opportunity costs of their cash reserves might be affecting their investment decisions.

Chapter 2: Back in Style: Contrasts in Style and CEO Impact on Corporate Policy

This chapter proposes a new approach to study how corporate policies change upon the replacement of the CEO. We develop a measure that explores the differences in style between the exiting CEO and the incoming CEO. We find that corporate policies change significantly in firms when the new CEO has a different style compared to the previous CEO. Whereas, in firms that the CEO is replace by someone with a very similar style, corporate policies remain largely unchanged. For the most part, our results are not significantly different if we consider

exogenous exits (e.g. death, illness, and natural retirements). Thus, the relation between CEOs and subsequent corporate policy is not driven by the characteristics of the exiting CEO, but is instead determined largely by the characteristics of the new CEO. The evidence suggests that boards are endogenously selecting the new CEO to have the characteristics that the board members think will best serve the firm. Thus, it is difficult to separate the role of the board from the CEO when explaining corporate policy.

To Fernanda and My Parents

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Chapter 1

Easy Come Easy Go: Cheap Cash and Bad Corporate Decisions

1.1 Introduction

Corporate cash holding has become a favorite topic of the popular media, politicians and academics after its recent spike. The finance literature has sought an understanding of whether this excessive liquidity is optimal and has tried to predict how firms with large amounts of cash will spend it. Although the analysis of firm cash reserves has been explored extensively in the corporate finance literature, a few basic and crucial questions remain unanswered: Where does the cash that firms are currently holding came from? Did it come from operations, financing activities, or the sale of assets? Does the manner in which firms save their cash predict how they are going to spend it?

This paper seeks to determine which sources firms are using to build their cash reserves. I develop a method that treats the three cash flow statement categories (operating, financing and investing) as separate accounts through which cash enters and leaves the firm to

identify the origin of the cash. Thereafter, I create a new dataset in which each dollar in the firms' cash holdings is labeled to determine the reserve's current composition. This new data set puts me in a unique position to explore how firms with different savings profiles spend their money differently. Consequently, it allows me to test the predictions of different hypothesis about cash management in a completely new framework. For instance, excessive cash holdings is considered a source of agency conflict. However, different sources of cash should give the manager different levels of flexibility. Firms with more cash from financing activities should be subject to more monitoring than firms with more cash from operations. With this new data set I will be able to test these differences and, for example, find that the free cash flow hypothesis predictions for high cash holdings do not seem to be precise for firms that have excessive amount of cash holdings coming from financing activities.

My first approach was to compare how firms with more cash from financing activities perform in their Merger and Acquisition (M&A) activity when compared to firms with more cash from operations. Using the framework developed by Harford (1999), I find that firms with a greater percentage of cash from financing activities behave differently than similarly positioned firms with a percentage of cash from operations. Harford (1999) finds that firms with more cash holdings are more likely to engage in M&A activities and that such activities generally destroy value. I find evidence that firms that derive their cash reserves from operations are largely responsible for the reputation for poor M&A judgment generally associated with all cash rich firms. Firms with greater amounts of cash obtained from financing activities are less likely to engage in M&A activities, and they do not destroy value if they

do engage in such activities. In other words, these latter firms are not overspending the cash they have on their books.

Moreover, I analyze how firms with different compositions in their cash reserves perform in their share repurchases. The results reinforce the contrasts found on the M&A analysis. I find that firms with greater proportions of cash from financing activities perform better than firms with greater proportions of operational cash. In fact, the positive announcement return for repurchases previously associated to firms with high cash Grullon and Michaely (2004) is driven by firms with high volumes of cash from financing activities. Firms with a larger fraction of their cash coming from operations actually present negative announcement returns to their repurchases. This findings shed a new light on this relationship because it provides evidence against the main explanation for the results found previously. The explanation given by the existing literature for the reason firms with large cash reserves present a positive announcement return for their share repurchases is that, by doing a repurchase these firms are alleviating the agency conflict generated by excess cash. For these reasons investors will respond positively to this action. My results contradicts this interpretation, because firms with more cash from operations are subject to more agency problems. If we were simply dealing with an agency conflict we should observe higher announcement returns for firms with high cash from operations. Investors should respond positively to the fact that firms that could potentially overspend their cash, are instead returning it to them.

In light of this puzzling result, I seek for an alternative explanation for the repurchases

results exploring the reasons why these contrasts in returns are observed. I argue that there are two complementary hypotheses to explain the difference in the behavior of firms with more cash from financing activities compared to firms with more cash from operations. The first possible explanation is the disciplinary effect of external financing. Until now, the literature has treated cash holdings simply as free cash. However, this assumption seems to be too broad in light of the framework developed in this paper. Cash from financing activities does not give the manager as much financial slack as cash from operations. The disciplinary effects of debt are well documented in the literature Jensen and Meckling (1976); Jensen (1986); Hart and Moore (1995). In addition, every time a firm issue equity it will have its books scrutinized by the market Easterbrook (1984). After the issue, we should also expect that new investors will be paying more attention to what the manager is doing, until they gain confidence in her. Furthermore, the primary investors in an IPO or a SEO are generally insiders, institutional investors, underwriters, and preferred clients who are more sophisticated and after increasing their stake on the firm will likely keep the manager on a tighter leash.

The first hypothesis explains why firms with more cash from financing activities are likely to behave better; however, it does not explain why firms with more cash from operations use their financial freedom to systematically invest in "bad deals". Better deals would imply better returns for the firm, a higher salary and a longer tenure; thus, these managers should be searching for good investments and this should be captured in the data. These firms should have returns at least as good as the average firm. In my second hypothesis, I argue that the

inexpensive nature of cash from operations, combined with the low returns associated with this cash, misleads the management team in its calculation of the opportunity costs of cash. For this reason, they use an incorrect cost of capital when evaluating the investments they are going to pursue.

In order to find evidence for my second hypothesis, I explore firm's misvaluations around the repurchase announcement. If firms with more cash from operations have a superior understanding of their cost of capital, they will be able to calculate their intrinsic value more precisely and therefore time the market more efficiently. My results are consistent with this idea, I find that firms with a higher percentage of their cash coming from financing activities are less likely to do a share repurchase when their stock is overvalued. Firms with more cash from operations, on the other hand, time the market poorly and are more likely to do a repurchase when they are overvalued. This evidence reinforce the results against agency problems. Firms with more cash from operations seem to be having worst outcomes to their share repurchase because they time the market poorly and not because the market is responding to some sort of agency problem this firm has.

I find supportive evidence for this hypothesis in the final step of my analysis. I observe the behavior of firms holding greater percentages of cash from operations with respect to the returns on their cash investments. I argue that these firms are underestimating their costs of capital, because cash from operations has no direct costs and has a low return. If the returns on their cash investments are higher, the direct opportunity costs are higher. Therefore,

firms with higher returns on their cash investments should better understand opportunity costs of cash and consequently make better deals. I investigate how firms with different returns on their cash holding make different decisions when making an acquisition. I find that firms with a large proportion of cash reserves coming from operations who have higher returns on their cash investments are less likely to bid on an acquisition than the same type of firm with lower returns. Moreover, these same firms with higher returns on their cash investments present higher announcement returns than similar firms with low returns on their cash holdings. This offers some evidence that the perception of the opportunity costs of cash plays an important role in how firms decide to invest it.

In addition, my analysis of cash holdings also allows me to study their historical composition. I begin my analysis by ascertaining the origin of these cash reserves. I find that the recent spike in cash holdings is primarily a result of an increase in the accumulation of cash from operations. This picture has changed in the past decade. Prior to 2000, almost 1/3 of the cash firms held had come from financing activities. After 2000, there was a significant increase in cash reserves from operations that was not accompanied by a spike in cash from financing activities. Nevertheless, even with the large amounts of cash currently on the books of firms, the amount of cash from financing activities never actually decreased. Out of the $2 trillion currently on the books of US public firms, $250 billion came from financing activities. In addition, consistent with Dittmar and Duchin (2012), I find that the recent increase in cash is concentrated in the hands of a few firms that accumulated it from their stable stream of profits (operations). When I normalize the cash reserves by the firm's

total assets, I find that firms hold a similar proportion of their assets on cash from financing activities and operating activities, on average, and that this proportion is actually slightly greater for cash from financing activities than from operations (because of the skewing of the distribution of cash from operations). Therefore, cash from financing activities plays an important role on the firm's cash management.

Second, I check whether the behavior of the cash flow and cash holdings variables separated by source is consistent with their aggregate counterpart found on COMPUSTAT. To accomplish this, I compare the distributions of and changes in the variables created by my methodology with the distributions of and changes in total cash. The total flows from the three accounts (Operations, Financing and Investment Activity) consistently track the changes in total cash holdings. In addition, their mean and the standard deviation are consistent with the COMPUSTAT variables. I also observe that there is not a significant discrepancy in how much cash from operations firms are holding across firms and that firms usually have more cash from financing activities in the beginning of their lives. Finally, I decomposed the cash from financing activities to determined whether the cash came from debt or equity. Following McKeon (2013) I also separate equity issuances by wether they were initiated by the firm or by investors. I found that during the 1970's and the 1980's debt was the most popular source of cash from financing activities. Consistent with McLean (2011), after the 1990's cash from equity increase its share and it currently represents the majority of the cash from financing activities. Consistent with McKeon (2013) investor initiated equity issuance is increasing its share over the years.

Furthermore, I investigate whether any of the separated cash holding variables have a transitory characteristic. One may be concerned, for instance, that all cash from financing activities were previously earmarked and that they would only stay on the firm's books for a short period of time until the earmarked investment is realized. My results show that this is not true; the persistence of cash from operations, cash from financing activities and total cash holdings are similar. Therefore, different firms use different sources for their cash management and none of the separated cash variables has a transient characteristic.

The results show that deconstructing the cash holdings can teach us something useful about firms. Cash composition reveal relevant cross-sectional differences between firms, not captured by other variables available in the data. This distinction will be useful for the future empirical analysis in corporate finance, as we should consistently see differences between these two groups, regardless of the problem we are considering. In addition to that, the results change the perception of efficient cash holdings allocation. Up to this point, efficient cash holdings were determined simply by a level characterized by the firm's and its industry's characteristics. This paper shows that we need to add another dimension into considerations, because two firms with the same cash levels could behave very differently depending on their cash composition.

1.2 Connection to Existing Literature

This study contributes to the existing literature in several ways. First, to the best of my knowledge, this is the first paper that explores the different ways that companies accumulate cash and examines whether cross-sectional differences in cash composition provide meaningful information about the way the firm will end up spending the money. Most of the existing literature about cash has built upon the framework developed by Jensen (1986), Jensen and Meckling (1976) and Myers and Majluf (1984) which treats cash reserves as a source of agency conflict. The conflict between managers and owners is built into the structure of a public firm Jensen and Meckling (1976); Hart and Moore (1995); Holmstrom (1979), and free cash flows aggravate this situation. Free cash flows give the manager discretion to decide how to spend firm money Jensen (1986). Harford (1999) finds evidence of the free cash flow hypothesis on a firm's M&A activity, while Grullon and Michaely (2004) observe that information asymmetry drives the positive stock reaction of share repurchase for cash-rich firms.

The previous literature assumes that cash holdings are simply a pile of free cash flow Harford (1999) and ignore the fact that cash holdings may also be a result of financing activities. Kim and Weisbach (2008) and Hertzel and Li (2010) find evidence that companies are also using SEOs and IPOs in their cash management and McLean (2011) shows an increase in the use of these instruments for cash management over the years. If, for instance, firms are holding cash from debt, we should expect the disciplinary effects of debt Jensen

and Meckling (1976); Hart and Moore (1995) to attenuate or even offset the agency conflict effects that come with the increase in cash holdings. To the best of my knowledge this is the first paper that attempts to label each dollar of the firm to try to separate what is actual free cash from what it is not.

There are also positive aspects of cash holdings, according to the literature. Using internal financing, firms can avoid debt overhang problems Hart and Moore (1995) and adverse selection as a result of issuing equity Myers and Majluf (1984). These types of financing friction make external financing costly and internal financing beneficial. Therefore, one should expect firms with more investment opportunities and more information asymmetry to have higher cash reserves. This result is well documented in the existing empirical literature[1]. In addition, this paper also connects to the literature that uses the precautionary motive to explain the recent increase in cash holdings in US public firms Bates, Kahle, and Stulz (2009); Pinkowitz, Stulz, and Williamson (2012).

Another goal of this paper is to show that cash from financing activities actually presents the management team with a clearer idea of their costs of capital. To properly time the market, firms will require good knowledge of their cost of capital to price their assets correctly. In the M&A literature, it is well documented that misvaluation drives acquisition activity (e.g. Dong, Hirshleifer, Richardson, and Teoh, 2006; Rhodes-Kropf, Robinson, and Viswanathan, 2005; Loughran and Vijh, 1997; Rau and Vermaelen, 1998; Agrawal, Jaffe,

[1]See for example: Almeida, Campello, and Weisbach (2004), Harford (1999), Opler, Pinkowitz, Stulz, and Williamson (1999), Bates, Kahle, and Stulz (2009), Gao, Harford, and Li (2012), Farre-Mensa (2011)

and Mandelker, 1992). In addition, firms are more likely to make repurchases when they are undervalued Baker and Wurgler (2002); Ikenberry, Lakonishok, and Vermaelen (1995). In summary, timing the market is one of the primary concerns of a firm in making its financial decisions Graham and Harvey (2001). However, evidence shows that managers do not have a good understanding of even the concept of the cost of capital Kruger, Landier, and Thesmar (2011). Miscalculating the cost of capital may lead to misvaluations in both M&A and repurchase activity, which may, in turn, explain the negative returns in connection with their announcements. The incorrect use of cost of capital in different divisions is an example of this anomaly previously found in the literature. In a recent paper Kruger, Landier, and Thesmar (2011) find evidence that managers erroneously use the cost of capital calculated on a firm-wide basis to make investment decisions for separate divisions of the firm; certain managers actually admit they are doing this Graham and Harvey (2001). In this paper, I argue that this problem may be even worse than previously thought.

Finally, this paper complements our understanding of the recent increase in the cash holdings of US firms Bates, Kahle, and Stulz (2009). By separating the different sources of cash, this paper reveals that the recent spike may be mostly explained by an increase in accumulation of cash from operations. However, consistent with Dittmar and Duchin (2012) I find that the cash from operations is concentrated in the hands of a few firms that benefited from a steady stream of profits and that cash from financing activities plays an important role in the firm's cash management.

1.3 Hypotheses

The goal of this paper is to analyze the cross-sectional differences between firms with different cash compositions. In this section, I develop hypotheses to try to explain why there should be differences between firms with more cash from financing activities compared to firms with more cash from operations.

It is well documented in the theoretical literature about cash holdings that free cash flow will generate agency problems Jensen (1986). Until now, the empirical literature has treated cash reserves as a pile of free cash Harford (1999).); however, this literature ignored the fact that cash reserves can come from different sources, including debt. Debt has a disciplinary effect Jensen and Meckling (1976); Jensen (1986); Hart and Moore (1995). Cash reserves from debt are not considered free cash, and when the management team decides to spend the money, it will be subject to the disciplinary characteristics of debt. Consequently, managers will be more careful. As opposed to debt, equity has no disciplinary effect built into it. There is no threat of default, and there is therefore no automatic punishment for a bad investment. However, there are at least two reasons why cash from an equity issuance may also decrease management's freedom. First, in general, the initial investors who obtain access to an equity offering will be company insiders, institutional investors, underwriters, and preferred clients. These investors are generally more sophisticated and more likely to monitor the firm; if they increased their stake in the firm, they will be more attentive to where the money is going. Second, new investors will be closely watching their investment until they actually know and trust the management team. Over time, familiarity with the

management team may decrease the benefits of monitoring.

Hypothesis 1 Firms with more cash from financing activities will be subject to more monitoring

The first hypothesis explains why managers of firms with more cash from operations would be more likely to overspend the money, but does not explain why they systematically make bad investments. Better investments would yield higher returns, which would consequently increase their salary and their tenure. Thus, it is not clear that the manager will systematically abuse the freedom given to them. Even with the financial freedom to invest in whatever they choose, managers should rationally be searching for good investments. This fact should be observed in the data, and these managers should perform at least as well as the average firm. I argue that such managers may miscalculate the opportunity costs of cash because cash from operations has no direct costs and low returns.

Calculating the costs of capital for a firm can be demanding. Because a management team addresses a multitude of problems on a daily basis, it may overlook important nuances of the opportunity costs of cash Kruger, Landier, and Thesmar (2011). A manager may think of the opportunity costs of cash simply as how much the cash is earning at the moment. In other words, he could be thinking, "if my cash is currently earning 2% per year and I can secure an investment that is 4% per year, this should be a good deal," which, of course, would ignore the fact that he must use WACC for all firm investments. Cash from financing activities would hinder this because it is the most expensive type of cash a firm can have on its books; with the firm's cash coming from financing activities, the manager would have

a clear understanding of the costs of that cash. Thus, in making an investment decision, it should be easier to be more careful with the evaluation calculations. For this reason, I expect firms with more cash from financing activities to make more careful investment decisions.

Hypothesis 2 Firms with more cash from financing activities will have a better understanding of their costs of capital

1.4 Data

This paper constructs new variables to determine how firms save cash and then seeks to understand whether information about how firms save cash provides useful information about how firms use the cash. Therefore, I look first to see whether there is a consistent pattern of this type of firm across different branches of the literature, particularly as it relates to M&A activities and share repurchases. For this reason, the data for this paper comes from several sources.

The backbone of the analysis comes from the COMPUSTAT files, from which I obtain the accounting information of firms. In 1987, the FASB adopted the Statement of Financial Accounting Standard (SFAS) 95 entitled "Statement of Cash Flows." For this reason, I can only construct the excess cash flow variables beginning in 1988; therefore, the data I use covers the years between 1988 and 2010. I consider all cash prior to this date equal to zero. The information for both the merger & acquisitions and the repurchases analyses comes from Thompson's Security Data Corporation (SDC) data sets. The information on stock returns come from CRSP files. To create the normal cash holdings variable in my M&A analysis, I

also require information on recession quarters, which I obtain from the National Bureau of Economic Research, and the spread between AAA and Junk bonds, which I obtain from the Federal Reserve.

The construction of the database follows standard practices in each of the branches of the literature considered. I winsorize every variable in the analysis at the 1% level. I do all the analyses by both including financial firms and utilities (SIC codes 6000-6999 and 4900-4999) and excluding them. For both analyses, I use only firms that I was able to merge with the COMPUSTAT and CRSP files. For the M&A analysis, I only use mergers that are greater than 1% of the acquiring firm's total market value, I only use transactions labeled "Acquisition of Assets" or "Merger", and I only use transactions in which the acquiring firm had less than 50% of the equity of the target and was acquiring 100%.

1.5 Separating the Origin of Cash: Variable Construction and Analysis

To determine where the money firms are saving is coming from, I explore the details contained in the cash flow statement of the firms. The cash flow statement is separated into three different categories. The first item of the statement is "*Cash Flows From Operating Activities*". This section includes net income and other items such as depreciation and amortization, stock-based compensation and changes in operating working capital and non-current assets and liabilities; this cash flow concerns cash flow from the everyday activities of the firm. The second item is the "*Cash Flow From Investing Activities*", which includes

investments, capital expenditures, acquisitions of business and proceeds from the sale of assets; this is cash flow from buying and selling assets. Finally, the third item of the cash flow statement is the "*Cash Flows From Financing Activities*", which includes any stock or debt issuance or repurchase and proceeds and repayments of borrowing.

To determine the excess cash generated by each account, I utilize a few simple steps: First, if all three cash flows were positive, then the excess cash generated by each account is simply the cash flow. Second, if one or more of the cash flows is negative, I initially use the cash that was accumulated from previous years in that account and only after that do I use the positive cash generated by the other account(s). The idea behind this is to try to recognize cash that was raised and never used. For example, if in one year I raised money through an equity issuance but did not use the entire amount and repurchased shares the next year, the "firs" money that should be used for the repurchase is the money raised through the financing activity (the equity issuance). Third, if the savings in a specific account are insufficient to pay for the expenses in that year, I use money from other accounts to fund the gap. Initially, I use cash flows generated by the positive accounts in the same year. If the aggregate cash flow of that year was positive, the positive account(s) will contribute proportionally to the size of their cash flow; an account with a higher cash flow will contribute more. In this case, the excess cash flow from the accounts with positive cash flows will be reduced and will eventually be whatever is left after covering the deficit of the other account(s). Finally, if the aggregate cash flow of the three accounts was negative, I use the available savings from the other accounts to fund the deficit in a proportional manner, as

described above. Thus, even if an account had a positive cash flow, it will have a negative surplus or excess flow. Once I have all the excess cash flows, I simply accumulate them over the years, never letting them reach values below zero. Figure 1 presents a diagram with an example of this process.

In addition, Table 1.1 details different examples of how I manipulate the original cash flows to generate the excess cash and cumulative cash variables. The first line shows an example in which there is no savings and the aggregate cash flow is negative; thus, the firm spent more than what they had (there is an inconsistency in the reported numbers). In this case, all the excess cash flows are zero and there is no cash accumulation for that year. In the second line, we have a positive aggregate cash flow, indicating that the firm is increasing its cash reserves. Note that both the operations and the finance cash flows are identical, for this reason they contribute equally to fund the negative flow from the investment account. The final excess cash flow from investment is zero, although the actual cash flow was negative. Because there was no cash saved in this account, there cannot be an outflow from it this year (a firm cannot have negative cash holdings by construction). The third line presents an example of a negative cash flow in an account that previously had some cash accumulated in it. Note that the "first" cash I use to fund this account is always the savings from that account. Finally, the fourth and the fifth year show examples in which the aggregate cash flows were negative; in these cases, the firm is decreasing its cash holdings. In the fourth year, all cash flows are negative or zero, and the firm uses the savings accumulated in the Operations and Financing accounts to fund the negative flows on the investment accounts.

This is accomplished by taking the money proportionally to the account size. In the fifth year, only cash from the operations account is positive. I initially use the cash flow generated that year to cover the deficit, then I use the accumulated cash left in the operations account

In summary, the variables created here capture the instances in which some cash is generated in a given account but was not used. Facebook may become a good example for this methodology in upcoming years. It had its IPO recently, but do not have a clear destination for the cash they received. In the coming years, if all its investments are financed by its cash flows, then this would indicate that it actually did not require the IPO in the first place (at least not to raise capital for investments). Therefore, under this analysis, they will have an excess amount of cash from financing activities.

All the results reported here use the data created using this methodology. However, I tried 7 different constructions of the data set:

- Use all Cash (Cash Flow and Savings) from Financing Activities First
- Use all Cash (Cash Flow and Savings) from Operating Activities First
- All positive Cash Flows first, Savings From Financing second and other accounts savings last.
- All positive Cash Flows first, Savings From Operations second and other accounts savings last.
- Old Cash First (Savings), New Cash second (flows)

- Cash Flows Sequentially (Financing, Operations and Investing), then Cash Saved Sequentially (Financing, Operations and Investing)

The results remain qualitatively identical regardless of the way I construct the variables. The results change with the construction by becoming stronger if the criteria for holding cash from financing activities become tighter. For example, if I use all cash from financing activities first, only firms that really held cash from financing activities will remain with some amount of this cash on their books. The effects for this construction seem to be stronger. Conversely, if I loosen the criteria for holding cash from financing activities (e.g. by using cash from operations first), thereby increasing the number of firms with more cash from financing activities, the results seem to weaken; however, they are still qualitatively the same as the original construction.

1.6 Firms' Cash Composition

The next step of the analysis is to explore the variables created. First, I investigate whether their behavior is consistent with the aggregated variables (Cash Flow and Cash Holdings) commonly used in the literature. I start by exploring basic summary statistics to see whether the distribution, the mean and standard deviation of the separated variables present any odd characteristic. Table 2.7 presents the main statistics for the variables created here and their aggregate counterpart. The means, the distributions and the standard deviations of the variables created are consistent with their aggregate counterparts. The majority of the cash flow comes from operations, followed by financing activities and investments. The identical

pattern is observed with the accumulated cash.

The evolution of the cash flows and the cash holdings of the firms also present an interesting pattern. Figure 1.2 presents the evolution of the aggregate cash holdings of the US firms, which is consistent with the findings of Bates, Kahle, and Stulz (2009), Cash holdings increased significantly after 2000, with public US corporations currently holding $ 2 trillion , a statistic that has been widely explored by politicians and the popular media. Another interesting fact is that cash from operations is responsible for most of the increase in cash holdings. Cash from financing activities played a more significant role in the past. Prior to 2000, cash from financing activities represented approximately 1/3 of public corporations' holdings. However, it is important to note that, even with the excessive amount of cash currently available on the books of firms, corporations still rely on financing activities for their cash management. In 2010, they held $ 250 billion in cash from financing activities.

According to Dittmar and Duchin (2012), the current increase in cash reserves is concentrated in the hands of a few firms that built their cash flow from a steady stream of profits. For this reason, I also explore the cash variables separated by source normalized by total assets. These findings are consistent with Dittmar and Duchin (2012), and show that the average ratio of cash to total assets did not undergo a dramatic change in the past decade. More importantly, on average, cash from financing activities represents a similar fraction of total assets as cash from operations. Therefore, cash from operations is not the dominating strategy for cash management. Different firms, of course, use different strategies to manage

their cash.

Figure 1.4 performs a similar analysis but explores the flow variables, using the aggregate cash flows coming from each account. The idea is twofold; first, each account's contribution to the increase in the cash holdings of the firms is tracked, and, second, the total movements in the three accounts are shown to be consistent with the changes in total cash holdings. Cash from operations was the most important source for cash accumulation in the past decade, which is consistent with Figure 1.2. However, cash from financing activities had an important role in the past and still represents a significant amount of firms' current cash flows.

In my final analysis, I evaluate the persistency of different types of cash reserves. This is important to mitigate concerns about the peculiarity of cash variables separated by source. For instance, it may be of some concern that all cash from financing activities is earmarked and would therefore be a temporary type of cash holdings. Firms will keep this cash on their books for a short period until the investments they are earmarked for are realized. I use the definition of excess cash holding [2] and persistency [3] found in DeAngelo, DeAngelo, and Stulz (2010). Figure 1.7 sshows the persistence of total cash holding and the cash variables separated by source. The results for the total cash holdings are consistent with those found in DeAngelo, DeAngelo, and Stulz (2010). In addition, cash from operations and cash from financing activities have a similar persistence as total cash holdings. Therefore, firms that

[2]Cash/assets - Normal Cash/Assets Normal Cash/Assets is the industry median within 3x3 size and market to book breakpoints, each year

[3]Percentage of firms in the top quartile in one year that continue to be in the top quartile in the following years.

have cash from financing activities are not more likely to use it first. Firms are indeed using financing activities as part of their cash management strategy.

1.7 Easy come, Easy go: Cheap Savings and Bad Expenses

In this section, I investigate whether the way the firms save their cash (either from financing activities or operations) provides useful information about how the firm will spend it. I do this by analyzing M&A and repurchase activities.

1.7.1 Mergers & Acquisitions Results

1.7.1.1 Probability of Bidding

According to Hypothesis 1, I expect that cash from financing activities do not provide the identical financial freedom as cash from operations as discussed in the Hypotheses section, cash from financial activities has more "strings attached". Therefore, one should expect that firms with a larger amount of cash from financing activities will not overspend even in situations in which they have large amounts of cash. To analyze this, I employ a methodology similar to the one developed by Harford (1999). The first step in his analysis is to create a normal cash level for each firm in the data. Normal cash is defined as the industry median predicted value of the following equation:

$$
\begin{aligned}
Cash/Sales_{i,t} &= \alpha_i + \beta_1 NetCFO/Sales_{i,t} + \beta_2 \Delta Riskpremium_{t+1} \\
&\quad + \beta_3 Recession_t + \beta_4 \Delta NetCFO/Sales_{i,t+1} \\
&\quad + \beta_5 \Delta NetCFO/Sales_{i,t+2} + \beta_6 M/B_{i,t-1} \\
&\quad + \beta_7 CFOVar_i + \beta_8 Size_{i,t-1} + \epsilon_{i,t} \qquad (1.1)
\end{aligned}
$$

Where $NetCFO$ is operating income before depreciation (oibdp) minus interest expenses (xint) minus taxes (txt) - Δ Noncash working capital (act-lct-che). $Risk\ \ premium$ is the spread between Junk and AAA bond yields, $Recession$ is a dummy variable indicating years that the National Bureau of Economic Research has defined as a recession, M/B is the market to book ratio, $CFOVar$ is the variance of firms cash flows and $Size$ is log assets. I run this regression with firm-fixed effects separately for each Fama-French industry classification. Excess cash is defined as the cash holdings for the period minus the median of the predicted value for the industry, normalized by total assets. To evaluate the relation between cash and M&A, I start by looking at the probability of bidding using the following specification:

$$
\begin{aligned}
Acquisition(0/1)_{i,j,t} &= \beta_1 * CashDev_{i,j,t} + CashDev_{i,j,t} * CashComposition_{i,j,t} \\
&\quad + CashDev_{i,j,t} * X_{i,j,t} + X_{i,j,t} + \mu_t + \delta_j \qquad (1.2)
\end{aligned}
$$

Where $Acquisition(0/1)_{i,j,t}$ is a dummy variable indicating that firm i in industry j at year t, bid on an acquisition. $CashDev_{i,j,t}$ is the deviation to the prediction of the cash management model in Harford (1999). To explore the cross-sectional differences of the cash

composition, I create different proxies for cash composition, represented in the equation by $CashComposition_{i,j,t}$. One of the proxies is the percentage of cash coming from a given source (either Operations or Financing), i.e., the fraction of cash accumulated that is coming from a particular account. To help with the interpretation of the estimators, I also use a dummy variable, that equals one if the percentage of cash from financing activities is in the top quartile of the distribution. Alternatively, I also tested a dummy variable that equals one when all of a firm's cash, comes from operating activities. Xi, j, t is a set of controls that include firm size, age, leverage, profitability, market-to-book-ratio, Net Working Capital, Sales Growth, Price-to-Earnings and previous year abnormal stock returns. Note that I also include the controls interacted by the cash deviation variable to ensure that the impact I am measuring is not captured by another variable previously available in the dataset.

Table 1.3 presents the results for the probability of bidding on an acquisition target. Column (1) presents the baseline results found in Harford (1999) showing that firms with larger amounts of cash are more likely to bid. Columns (2)-(4) show the results for the interaction term of cash deviation and different proxies for cash holdings from financing activities. Column (2) uses the fraction of the total cumulative cash from financing activities. Column (3) and (4) uses a dummy variable that equals one when the firm's percentage of cash from financing activities is in the top quartile of its distribution. The different proxies show essentially identical results. Firms with large cash holdings and firms holding cash from financing activities are less likely to bid on an acquisition than similar firms with large cash holdings from operations. The results are robust to the inclusion of all the controls,

interacted controls and firm-fixed effects. In addition, Column (5) and (6) shows the results for the dummy indicating that all the firm's cash came from operations. These firms are more likely to bid; in fact, firms with larger amounts of cash from operations are driving most of the results previously found in the literature that firms with more cash are more likely to bid. The findings are also robust to the inclusion of firm-fixed effects.

The results are consistent with the first hypothesis. Financing cash does not provide the financial permissiveness provided by cash from operations. The results show that firms with financing cash hold that cash closer and more dearly; managers are not making acquisitions simply because they have more cash on their books. In addition, I use the excess cash variables found in Opler, Pinkowitz, Stulz, and Williamson (1999) and DeAngelo, DeAngelo, and Stulz (2010) with qualitatively identical results.

1.7.1.2 Announcement Returns

I now turn to the cross-sectional differences in these performances when firms bid on an acquisition. For this purpose, I employ a cross-sectional analysis of the three-day announcement abnormal returns (-1,0,1) of the bidding firms. The specification used is as follows:

$$\begin{aligned} CAR(-1,1)_{i,j} &= \beta_1 * CashDev_{i,j,t} + CashDev_{i,j,t} * CashComposition_{i,j,t} \\ &+ CashDev_{i,j,t} * X_{i,j,t} + X_{i,j,t} + \mu_t + \delta_j \end{aligned} \tag{1.3}$$

The proxies for cash composition are identical to those used in the previous section. Note

that all the regressions are controlled for year and industry-fixed effects as indicated by μ_t and δ_j. The controls are similar to the ones found in the previous specification, but I also add a dummy for "all cash" acquisitions and the cumulative return for the 2 years prior to the acquisition.

Table 1.4 shows the results of a cross-sectional analysis. Column (1) presents the result found in Harford (1999) that firms with large cash reserves will have a worse announcement performance than the average firm. For columns (2)-(6), I employ the identical proxies for the composition of cash holdings used in the previous section. I find that firms with large cash reserves from financing activities do not destroy value when they do an acquisition. As with the results for probability of bidding, all the bad results found for firms with large cash holdings apply only to firms with a larger fraction of cash from operations. Column (6) shows that the interaction with the dummy indicating that all cash came from operations can explain all the negative variation previously associated with firms with large cash reserves (from any source).

The results are once more consistent with my first hypothesis. However, these results provide the first insight into the second hypothesis. Firms with more cash from operating activities are engaging in more acquisitions (which would sustain an empire-building hypothesis), and, in addition, they are more likely to choose a bad acquisition. To make this choice rational, the manager's private benefit of this single transaction must be higher than the benefits of a different profitable acquisition and all the downside risk of a bad acquisi-

tion must be minimized (lower bonus, less-desirable stock options, employment uncertainty). This suggests that these managers might be doing something wrong unintentionally. I argue that one possible explanation for this is that managers using cash from financing activities will use the correct cost of capital (or opportunity cost of cash) to evaluate their project because this type of cash is the most expensive cash a firm can have, and they will therefore only make economically prudent and profitable acquisitions.

1.7.2 Stock Repurchase Results

The results from the previous section offer some evidence that firms that obtain their money from financing activities seem to behave differently than firms that obtain the majority of their cash from operations. Firms obtaining cash through financing activities are less likely to bid, indicating that cash from financing activities does not provide the financial slack commonly observed in the previous literature. These firms also seem to be making better project evaluations, which may indicate that they have a better perception of their cost of capital. To extend this analysis, I move to the second field of the literature that ties in to this paper, Stock Repurchase Analysis. In his 2012 letter to the Berkshire Hathaway shareholder, Warren Buffet argued favorably for stock repurchases when firm liquidity needs are satisfied and the management team is certain that the firm's stock is undervalued [4]. In this section I explore how analyzing the different ways of obtaining cash may provide useful information about how effectively the firms will conduct stock repurchases.

[4]The full quote is: "*Charlie and I favor repurchases when two conditions are met: first, a company has ample funds to take care of the operational and liquidity needs of its business; second, its stock is selling at a material discount to the company's intrinsic business value, conservatively calculated.*" and can be found at: http://www.berkshirehathaway.com/letters/2011ltr.pdf, page 6

1.7.2.1 Announcement Returns

Hypothesis 2 predicts that firms with more cash from financing activities have a better understanding about the opportunity costs of the firm's cash and that these firms will therefore perform better in their repurchase announcement returns because their superior understanding of their cost of capital will make them more sensitive to the moments when they are undervalued. The first step I take to analyze this is to determine whether firms with different cash savings profiles actually perform differently when they conducting share repurchases. I use a similar specification as the one found in Grullon and Michaely (2004). I employ the cross-sectional analysis of the three-day announcement returns:

$$\begin{aligned} CAR(-1,1)_{i,j} &= \beta_1 * Cash_{i,j,t} + Cash_{i,j,t} * CashComposition_{i,j,t} \\ &\quad + Cash_{i,j,t} * X_{i,j,t} + X_{i,j,t} + \mu_t + \delta_j \end{aligned} \tag{1.4}$$

Where $Cash_{i,j,t}$ is the firm's total cash and cash equivalents normalized by assets, the variables labeled $CashComposition_{i,j,t}$ are the same proxies used previously, and $X_{i,j,t}$ is a set of controls that follow Grullon and Michaely (2004) and include a firm's age, size, market-to-book, leverage, changes in returns to assets and percentage of shares announced to be repurchased.

Table 1.5 presents the results of the cross-section analysis of the announcement returns. Column (1) presents the results found in Grullon and Michaely (2004)), where they find that firms with larger cash reserves present higher announcement returns for share repurchases.

Columns (2)-(4) show that this result is mainly driven by firms with more cash from financing activities. Column (5) shows that firms with more cash from operations actually present negative announcement returns for share repurchases

The results in table 1.4 provide additional evidence for my second hypothesis. If agency problems or lack of monitoring/advising was so important, investors should not be so "unhappy" with the news that firms are returning their money to investors. In addition, the results for firms with more cash from financing activities show that there is a complex explanation for what is happening. If we were simply dividing firms into "good" and "bad" firms, investors should not be so "happy" that the good firms are returning their cash. In the next section, I will explore one possible explanation for the difference observed here.

1.7.2.2 Overvaluation and the Probability of Stock Repurchase

According to Grullon and Michaely (2004), the explanation for the positive announcement returns to share repurchases is a result of agency problems that cash holdings may generate, i.e., investors value the cash outside the firm more than inside it. However, this explanation is not consistent with my previous findings. Firms with more cash from financing activities have lower levels of agency conflict and yet present positive announcement returns to their share repurchases. Firms with more cash from operations are more prone to have agency conflicts because the manager has discretion to decide where the money is going.

An alternative explanation, consistent with my previous findings, is that the positive

result found for stock repurchase announcements for firms with large cash holdings from financing is caused simply by better market timing. Firms with more cash from financing activities may be deciding the correct time to invest in a repurchase. To do investigate this possibility, I employ the methodology developed by Rhodes-Kropf, Robinson, and Viswanathan (2005). In their paper, they find that misvaluation drives M&A activity. To measure overvaluation, they start with the simple idea that, if we had the correct value of the firm, we could decompose the market-to-book ratio as follows

$$Market - to - Book \equiv Market - to - Value \times Value - To - Book \tag{1.5}$$

Mathematically, we would have:

$$\begin{aligned} log(M/B) &= log(M) - log(B) \equiv m - b \\ m - b &\equiv (m - v) + (v - b) \end{aligned} \tag{1.6}$$

Using this equivalence, they decompose the firm market-to-book ratio into the following three components:

$$m_{i,t} - b_{i,t} = \underbrace{m_{i,t} - \upsilon(\theta_{i,t}; \alpha_{j,t})}_{Firm} + \underbrace{\upsilon(\theta_{i,t}; \alpha_{j,t}) - \upsilon(\theta_{i,t}; \bar{\alpha_j})}_{Sector} + \underbrace{\upsilon(\theta_{i,t}; \bar{\alpha_j}) - b_{i,t}}_{Long-Run} \tag{1.7}$$

Where $\upsilon(\theta_{i,t}; \alpha_{j,t})$ is estimated using the following specification:

$$m_{i,t} = \alpha_{0,j,t} + \beta_{1,j,t} b_{i,t} + \beta_{2,j,t} ln(NI)^{+}_{i,t} + \beta_{3,j,t} I_{<0} ln(NI)^{+}_{i,t} + \beta_{4,j,t} LEV_{i,t} + \epsilon ij, t \tag{1.8}$$

where NI^+ is the absolute value of net income and $I_{<0}ln(NI)^+_{i,t}$ is an indicator function for negative net income observations. As the notation indicates, I run this regression separately for each Fama French industry classification and year. The parameters estimated therefore vary both by industry and year.

The difference between the firm's current market value and the estimated intrinsic value is: $m_{i,t} - \upsilon(\theta_{i,t}; \alpha_{j,t})$. This difference measures the idiosyncratic firm's misvaluations; thus, $\upsilon(\theta_{i,t}; \alpha_{j,t}) - \upsilon(\theta_{i,t}; \bar{\alpha_j})$ is the difference between the estimated value with current parameters and an estimated value using average parameters for a particular industry. The value estimated using the industry parameters captures the long-term estimated value for the firm; this is also called the time-series sector error, and $upsilon(\theta_{i,t}; \bar{\alpha_j}) - b_{i,t}$ is called the long-run error. It is the deviation of the long-term estimated value from the firm's book value using. This difference measures long-run misvaluations. These variables will provide proxies for different types of misvaluations that should be considered by the manager when considering a share repurchase.

To determine whether firms with more cash from financing activities are timing the market better, I evaluate whether these firms are more likely to do a repurchase when they are undervalued based on the proxies created by Rhodes-Kropf, Robinson, and Viswanathan (2005). I run a separate probit regression of the probability of announcing a repurchase on each one of the valuation error variables, using the following specification:

$$
\begin{aligned}
Repurchase(0/1)_{i,j,t} \;=\; & \beta_m * Valuation\ \ Error_{i,j,t,m} \\
& + Valuation\ \ Error_{i,j,t,m} * HighCash_{i,j,t} \\
& + Valuation\ \ Error_{i,j,t,m} * HighCash_{i,j,t} * CashComposition_{i,j,t} \\
& + X_{i,j,t} + \mu_t + \delta_j + \theta_i
\end{aligned} \tag{1.9}
$$

where $Valuation\ \ Error$ is one of the three proxies for misvaluation from Rhodes-Kropf, Robinson, and Viswanathan (2005), $HighCash$ is a dummy indicating that the firm is in the top quartile of the cash distribution, and $CashComposition_{i,j,t}$ are the proxies for cash composition used in the other sections of the paper.

Table 1.6 shows the results for the undervaluation analysis, divided into 3 panels. Each panel is the analysis of one of the measures of misvaluation. Panel A shows the results for the firms' specific error. This measure captures idiosyncratic errors in the firm's valuation. Column (1) shows that firms in general time the market and are less likely to do a repurchase when they are overvalued 6. Column (3), shows that the results found in column (1) are primarily driven by firms with more cash from financing activities. Firms with more cash from operations are actually more likely to do a repurchase when they are overvalued (as shown in Column (6)). The results in Panel B and Panel C confirm that firms with more cash from financing activities time the market better and that firms with more cash from operations are worse, regardless of the measure we are using for overvaluation.

These results are consistent with Hypothesis 2, once again firms with more cash from operating activities are systematically choosing bad investments. In this case, they are making incorrect bets on their own value. For the repurchases, we can exclude the possibility of private benefit, and therefore the manager must be looking simply for the best opportunity to invest this cash. These managers must systematically be making mistakes that managers of firms with more cash from financing activities do not make. I argue that the reason for this that that they have an incorrect perception of the opportunity costs of cash. In the next section, I will provide further evidence of this behavior.

1.7.3 Returns on Investments

The existing literature about cash reserves treats cash holdings as free cash flow. Free cash flow gives the manager freedom to act in his own interests that will drive him to make bad investment decisions for the firm. Throughout this paper, I argue that this explanation may be incomplete. Even if they are seeking private benefits, managers should be interested in profitable projects because they will increase their salary and their job security. Therefore, there must be an additional explanation for this behavior. My results for share repurchases reinforces the need for this explanation because these managers are making a bad investment that is not associated with empire building or private benefit.

I argue that the fact that cash from operations has no direct costs and also has low returns misleads these managers about the actual opportunity costs of cash. Managers may be thinking that employing this cash in a low return investment should be sufficient to guar-

antee a better use of this cash because it is returning the firm close to nothing. Conversely, cash from financing activities has a direct cost that reminds the manager of the actual opportunity costs of the cash they are holding. Another way to remind the manager about this opportunity cost of cash is a higher return on their current cash investments. The manager would be more careful in choosing another investment, because that investment would have a higher hurdle to be considered a better use of the cash.

To explore this, I analyze the cross-sectional differences in the M&A activities of firms with different returns on their short-term investments. The returns on short-term investments are the firm's interest income divided by total short-term investments. In this section, I use a derivation of the specification used in the M&A section of this paper:

$$\begin{aligned} Acquisition(0/1) &= \beta_1 * CashDev_{i,j,t} + CashDev_{i,j,t} * CashComposition_{i,j,t} \\ &+ CashDev_{i,j,t} * CashComposition_{i,j,t} * Ret.on.Invest_{i,j,t} \\ &+ X_{i,j,t} + \mu_t + \delta_j \end{aligned} \tag{1.10}$$

And

$$\begin{aligned} CAR(-1,1)_{i,j} &= \beta_1 * CashDev_{i,j,t} + CashDev_{i,j,t} * CashComposition_{i,j,t} \\ &+ CashDev_{i,j,t} * CashComposition_{i,j,t} * Ret.on.Invest_{i,j,t} \\ &+ X_{i,j,t} + \mu_t + \delta_j \end{aligned} \tag{1.11}$$

where $Ret.on.Invest_{i,j,t}$ iis the interest income divided by total short-term investments. All other variables are identical to the variables used in the M&A analysis.

Table 1.7 presents the results of the triple interaction regressions using returns on short-term investments. Panel A shows the results of the probit regressions of the probability of bidding on an acquisition. When firms have a higher return on their investment, they are less likely to bid on an acquisition. In addition, Panel B shows that they also perform better on their acquisitions, and have higher announcement returns.

The results are consistent with hypothesis 2. When the direct opportunity costs of cash are higher, managers are more careful in their spending. High returns on cash investments might be forcing them to pay more careful attention to their costs of capital. Consequently, they evaluate their investments better. It is important to note that these results are also consistent with the advising hypothesis. Higher returns on investment might indicate a closer relationship with the firm's bank and investors, which might provide the firm with better advice about its investments.

1.8 Conclusions

In this paper, I investigate how firms use different sources to build their cash reserves. Furthermore, I analyze whether the composition of the cash holdings provides meaningful information about the way the firm will spend its money. I develop a methodology to capture the source of cash and classify firms based on the different percentages of cash from financing or operating activities to analyze their subsequent expenditures on M&A activity and share

repurchases.

I find that the expenditure behavior of firms with a higher fraction of their cash coming from financing activities diverge significantly from the behavior of firms in general with large cash holdings previously found in the literature. The former firms are not more likely to bid on an acquisition simply because they have more cash, and when they bid they do not destroy value. In addition, firms with high percentages of cash from financing activities also perform better in their stock repurchases. This effect seem to come from better timing in the market because these firms are more likely to make a repurchase when they are undervalued. Finally, I find suggestive evidence that a better understanding of the costs of capital is what drives these results and find that firms with more cash from operations actually do better when the returns to their current cash investments are higher.

The results in this paper are consistent with the hypothesis that more cash can increase agency problems in a firm, but show that not all cash is identical; cash from financing activities may actually have disciplinary effects. The disciplinary effect could come in the form of closer monitoring/advising by investors because the cash the firm is hoarding came directly from their pockets. In addition, this paper suggests that the monitoring hypothesis might be incomplete because management interests (higher salary, higher tenure, etc.) may be aligned with the performance of the firm, even though the manager has investment discretion. I argue that the fact that cash from operations has no direct cost and expectations of low returns mislead managers with respect to the true opportunity cost of cash. Cash from

financing activities may provide the firm with a better picture of the opportunity costs of cash; because cash from financing activities is the most expensive cash the firm will hold, the management team will have a clear understanding of how much the new project must return for it to be worth investing. Consequently, although these firms may have large cash holdings, they will not engage in overspending.

Finally, this study provides some guidance about what not to expect from the accumulation of corporate cash holdings in recent years. The spike in cash holdings has spawned journalists, politicians and even academics to make predictions about merger waves and repurchase waves. This paper finds evidence that cash holdings by themselves do not provide meaningful information to make such predictions. Depending on the firm's cash holding composition, the results may actually go in either direction.

1.9 Figures

Figure 1.1: Generating Excess Cash Flow Variables Separated by Source

Figure 1.1 presents the methodology employed to obtain excess cash flows generated by each account. Cash Flow from operating activities is the total Cash flow coming from Operations obtained directly from COMPUSTAT. Similarly, Cash Flow from Financing and Investment Activities are the total cash flows from financing and investment activities, respectively. Cash from Operating, Financing, and Investment Activities is the accumulated cash from the Excess Cash Flows generated

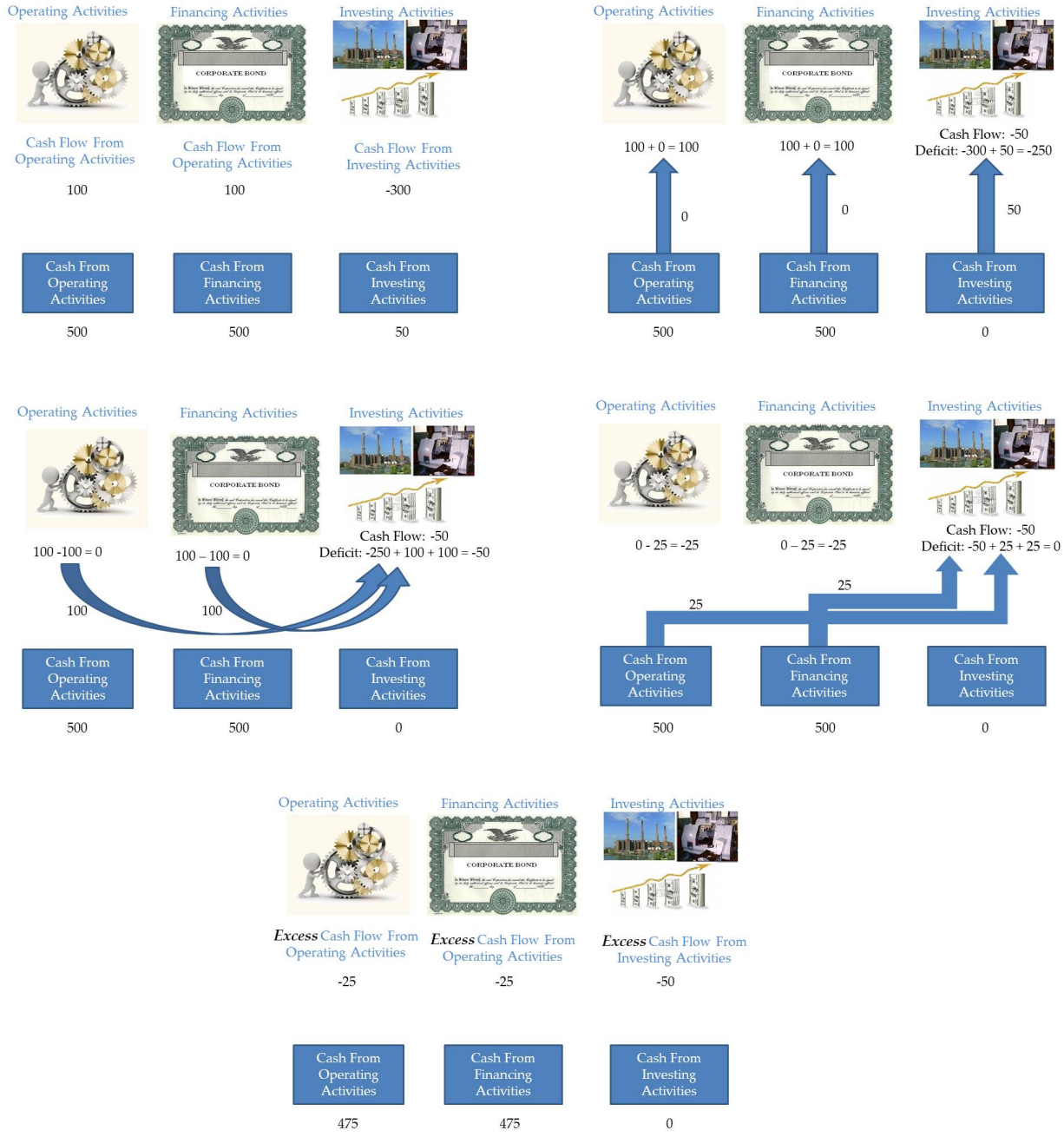
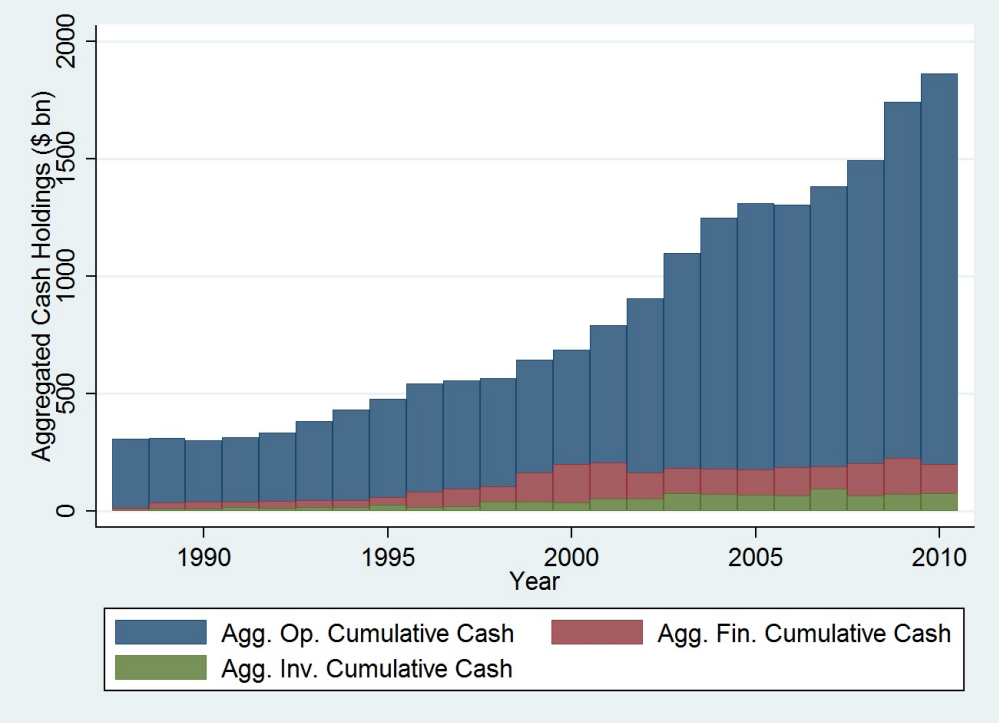


Figure 1.2: Average Cash Holding Separated by Category

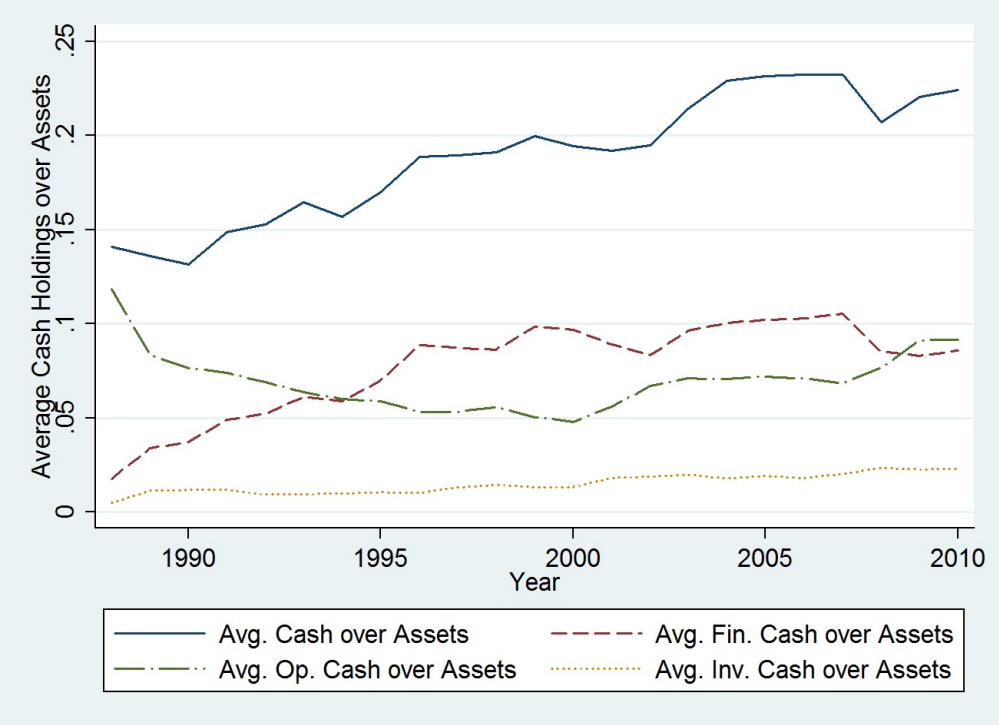
Figure 1.2 presents aggregate cumulative cash separated according to its source. Agg. Op. Cumulative Cash is cash that was accumulated from the excess cash flows from operations. Similarly, Agg. Fin. Cumulative Cash and Agg. Ivn. Cumulative Cash are the cumulative surplus from the Cash Flows from Financing and Investing activities, respectively.



Take away: Cash from Operations Represents the majority of the cash holdings of firms. However, Cash from financing activities still represents a significant amount of the cash holdings of US corporations; in 2010, the firms in the dataset were holding approximately 250 billion dollars in cash from financing activities.

Figure 1.3: Average Cash Holdings Separated by Source Divided by Total Assets

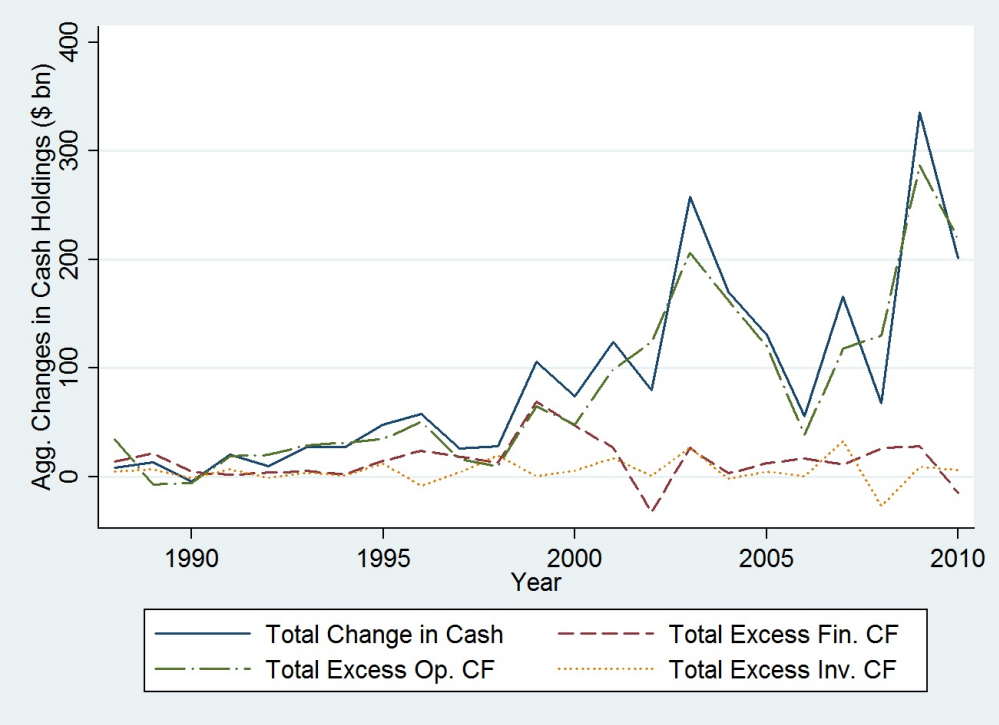
Figure 1.3 presents average cash by source normalized by total assets. Avg. Cash over Assets is the total cash holdings of the firm divided by total assets. Similarly Avg. Op. Cash over Assets, Avg. Fin. Cash over Assets and Avg. Inv. Cash over Assets are the total cash accumulated from operating, financing and Investing activities, respectively, divided by total assets.



Take away: The results here show that cash is concentrated in the hands of a few firms (consistent with Dittmar and Duchin (2012)) and that, on average, cash from financing activities actually represents a similar fraction of the firm's cash holdings as cash from operations.

Figure 1.4: Aggregate Excess Cash Flow Separated by Category

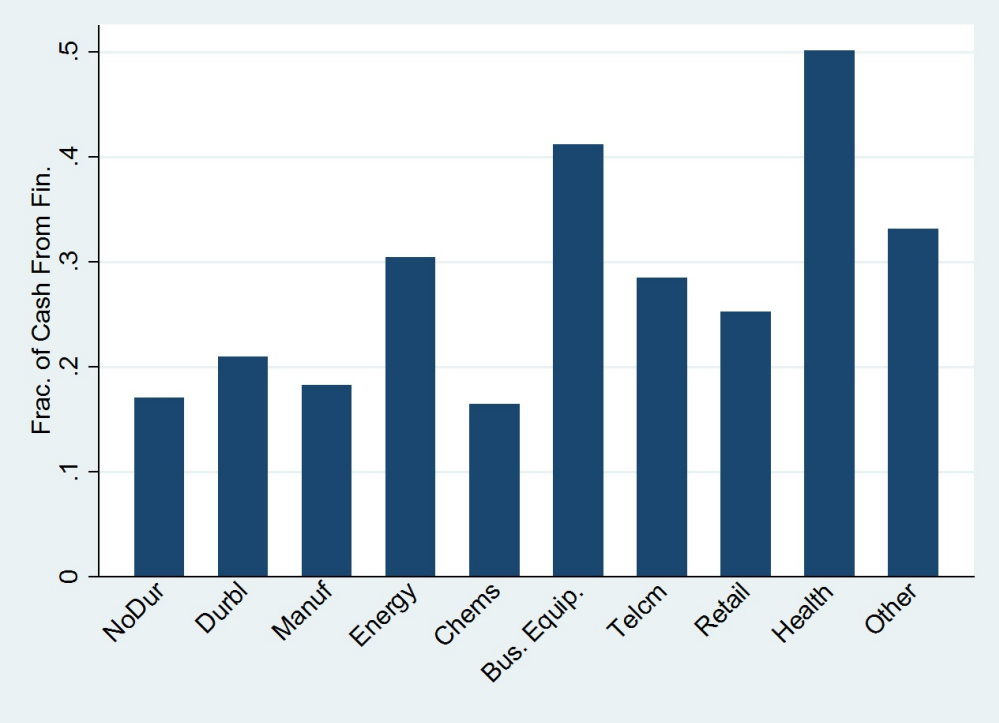
Figure 1.4 presents the total excess cash flow separated by the source of cash. Total Change in Cash is the COMPUSTAT variable for the changes in cash in the firm's balance sheet. Total Excess Op. CF, Total Excess Fin. CF and Total Excess Inv. CF represent the break down of the total changes into the three categories from the cash flow statement.



Take away: The results show that the dataset created here is consistent with the changes in cash from COMPUSTAT. In addition, I draw similar conclusions as from Figure 1. Cash from financing activities was a more important part of the changes in the cash holdings of the firm, and still represents a significant amount of the changes in the cash holdings of firms. In 2009, 28 billion dollars of the increase in cash holdings came from cash from financing activities.

Figure 1.5: Avg. Fraction of Cash From Financing Activities by Industry

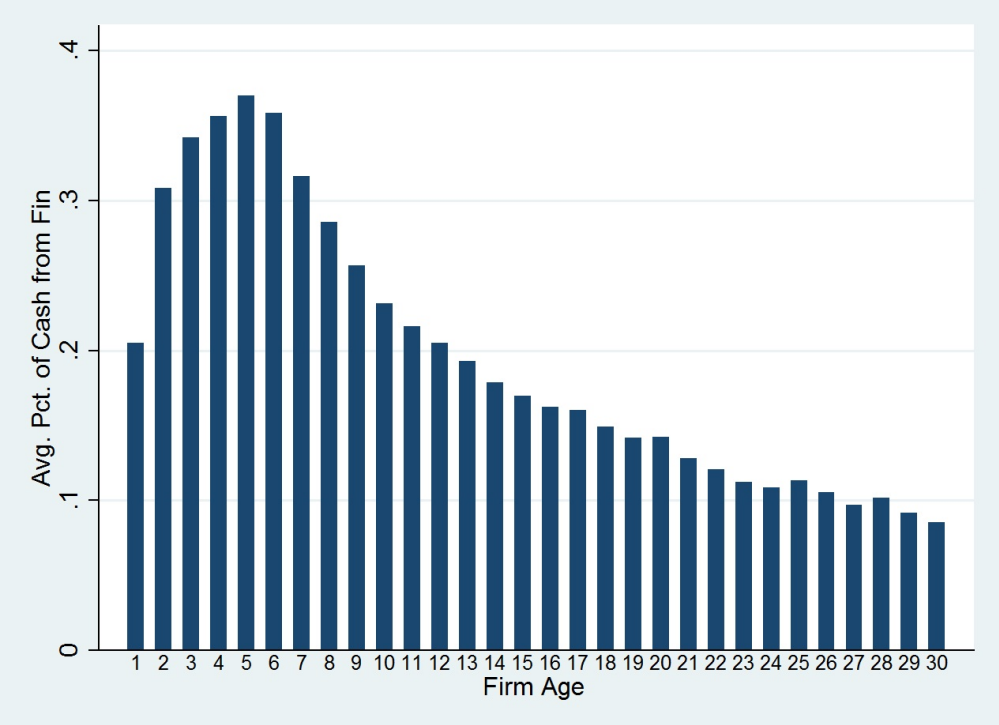
Figure 1.5 presents the average fraction of cash from financing activities separated by the Fama and French industry classification. The fraction of cash from financing activities of a firm is determined by the accumulated cash from financing activities divided by the total accumulated cash.



Take away: The results show that most industries present a similar average fraction of cash from financing activities. Business Equipments (Computers, Software, and Electronic Equipment) and Health (Healthcare, Medical Equipment, and Drugs) rely more heavily on financing activities to built their cash reserve.

Figure 1.6: Avg. Fraction of Cash From Financing Activities by Age

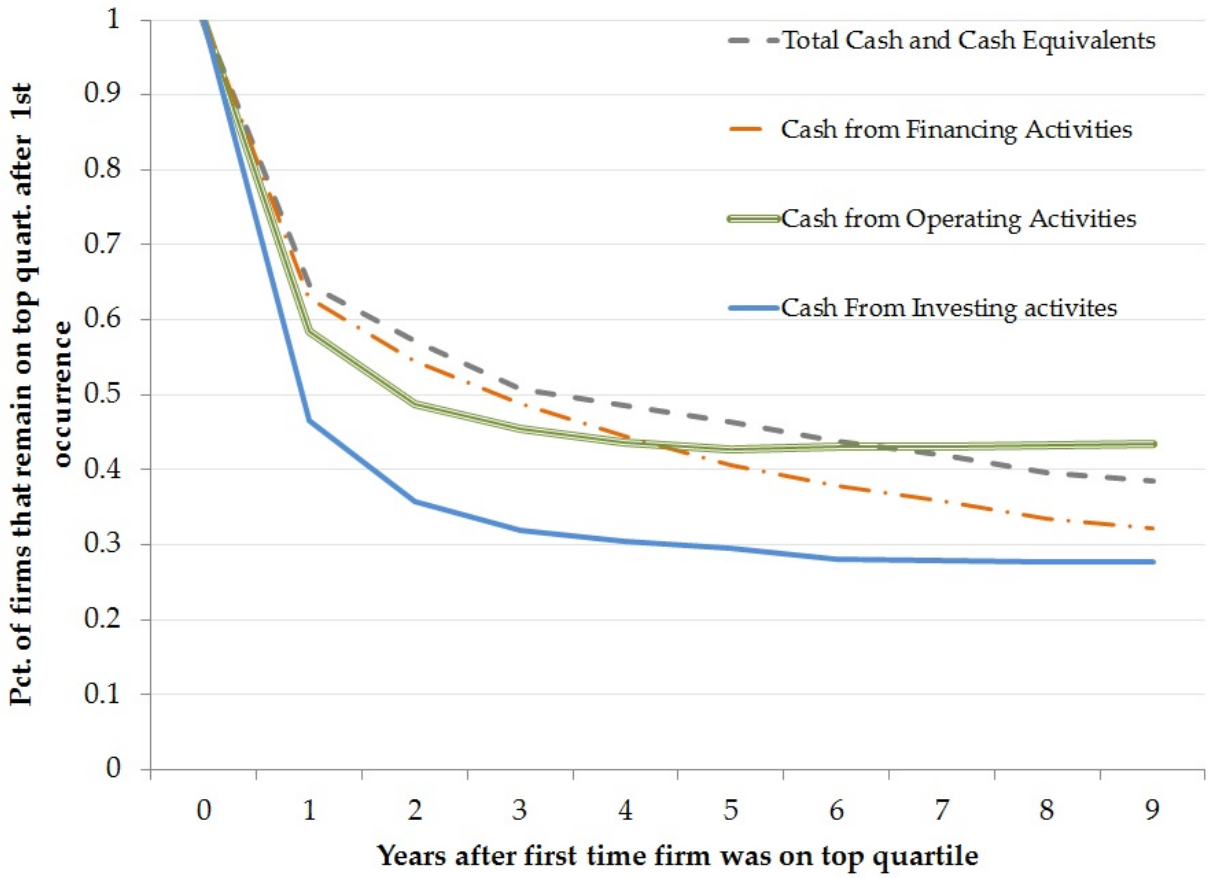
Figure 1.6 presents the average fraction of cash from financing activities separated by firm age. The fraction of cash from financing activities of a firm is determined by the accumulated cash from financing activities divided by the total accumulated cash.



Take away: Firms rely more heavily on financing activities to build their cash reserves in the beginning of their lives. This cash is replaced by cash from operations as they age. Nevertheless, they still keep a substantial amount of cash from financing activities at all stages of the firm's life.

Figure 1.7: Cash Holding Persistence Separated by Source

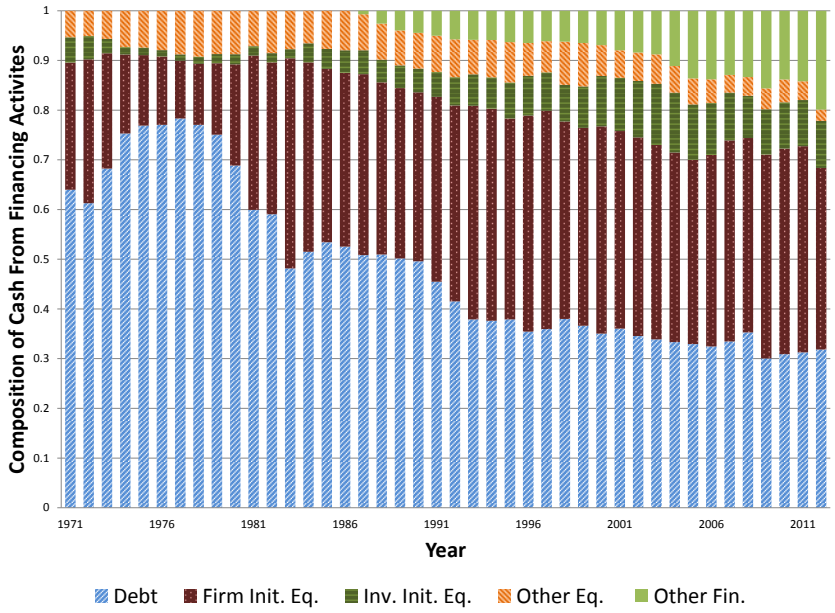
Figure 1.7 presents the persistence of total excess cash holdings, excess cash holdings from operations, and excess cash holdings from financing activities. The graph depicts the percentage of the firms that were in the top 4^{th} quartile of the Excess Cash holdings for one year, that continued to be in this group for the following years. Excess Cash holdings is defined by Deangelo, Deangelo and Stulz (2010), which is the industry median each year of a group based on size and market-to-book breakpoints.



Take away: Cash from financing activities is not a transitory holding that adjusts quickly. Firms hold cash from financing activities for the same amount of time they hold cash from operations and the average cash and cash equivalents.

Figure 1.8: Composition of Cash From Financing Activities Over The Years

Figure 1.8 presents the composition of the cash from financing activities over the years, separating it by wether it came from debt, equity or other financing activity. Following McKeon (2013) I also separate equity issuances by wether they were initiated by the firm or by investors.



Take away: During the 1970's and the 1980's most of the cash from financing activities was coming from debt. Consistent with McLean (2011), after the 1990's cash from equity increase its share and it currently represents the majority of the cash from financing activities. Consistent with McKeon (2013) investor initiated equity issuance is increasing its share over the years.

1.10 Tables

Table 1.1: Variable Construction

Table 1.1 presents a hypothetical example of how firm's excess cash flow and total cash holdings separated by source are created from the COMPUSTAT variables. *CF Op*, *CF Fin*, *CF Inv* are the COMPUSTAT variables: Net Cash provided (used) in operating activities, investing activities and financing activities, respectively. *Op Def*, *Fin Def Inv Def* are the deficit generated by each individual account when the cash flow was negative and there was no accumulated cash in that account to cover it. *Ex Op CF*, *Ex Fin CF* and *Ex Inv CF* are the flow variables used in the paper. They determine the excess cash provided (used) in each account. *Cum Op*, *Cum Fin*, *Cum Inv* are the cumulative sum of the flow variables, restricting them to be always positive.

Year	*CF Op*	*CF Fin*	*CF Inv*	*Op Def*	*Fin Def*	*Inv Def*	*Ex Op*	*CF Ex Fin*	*CF Ex Inv*	*CF Cum Op*	*Cum Fin*	*Cum Inv*
1	100	100	-200	0	0	-200	0	0	0	0	0	0
2	100	100	-100	0	0	-100	50	50	0	0	0	0
3	100	-30	30	0	0	0	100	-30	30	50	50	0
4	0	0	-40	0	0	-10	-8.82	-1.18	-30	150	20	30
5	20	-28.82	-30	0	-10	-30	-20	-18.82	0	141.18	18.82	0
6										121.18	0	0

Table 1.2: Summary Statistics

Table 2.7 presents the summary statistics for the cash variables created in this paper. *Cash Holdings* is the total cash the firm currently holds in its books from Compustat. *Op. Cash Holdings*, *Fin. Cash Holdings*, *Inv. Cash Holding* are the cash holdings coming from Operations, Financing and Investment activity respectively created for this paper, scaled by total assets. The categories are created based on the origin of the cash surplus. *Changes in Cash* is the total changes in cash, calculated using current levels of cash minus the previous year's cash levels. *Op. Cash Surplus*, *Fin. Cash Surplus* and *Inv. Cash Surplus* are the cash surplus generated by Operations, Financing and Investment activities respectively, scaled by total assets. The construction of these variables is explained in details in section 1.5.

Variable	mean	1^{st} Quartile	Median	3^{rd} Quartile	SD	N
Cash Holdings	117.4	0.658	5.087	30.07	806.6	167991
Op. Cash Holdings	77.77	0	0.279	9.921	598.9	165108
Fin. Cash Holdings	16.31	0	0.0129	3.492	174.5	165104
Inv. Cash Holding	5.412	0	0	0	142.8	164759
Changes in Cash	16.91	-2.257	0.0270	5.855	411.1	152797
Op. Cash Surplus	12.17	0	0	1.488	242.8	165108
Fin. Cash Surplus	1.924	-0.0500	0	0.262	108.6	165104
Inv. Cash Surplus	0.704	0	0	0	128.8	164759

Table 1.3: Predicting M&A bidders

Table 1.3 reports the results of the regressions of probability of bidding for an acquisition target. Panel A presents the results of probit regressions in which the dependent variable is a dummy that equals one when the firm has bid to acquire another firm in a given year and zero otherwise. *CashDev* is the cash deviation from the cash management model developed by Harford (1999). *PctFinCash* is the percentage of total cash coming from financing and activities. *HighFinCash* is a dummy indicating that that the firm's percentage of cash from financing activities are in the top quartile of the distribution. *OnlyOpCash* is a dummy indicating that all the firm's current cash holdings came from operations. The other controls are listed in section 2.6 and their construction details are available in the variable appendix. The internet appendix presents the full version of this table.

	Dependent Variable: *Acquisition*(0/1)					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Probit Regressions						
$CashDev$	0.285***	0.332***	0.295***	0.048	0.145**	-0.214
	(7.438)	(2.922)	(3.226)	(0.263)	(2.064)	(-1.427)
$CashDev * PctFinCash$		-0.235***				
		(-3.312)				
$CashDev * HighFinCash$			-0.217***	-0.315**		
			(-3.462)	(-2.380)		
$CashDev * OnlyOpCash$					0.115**	0.472**
					(2.048)	(2.451)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Interacted Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-effect	No	Yes	Yes	No	Yes	No
Year Fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed-effect	No	No	No	Yes	No	Yes
Observations	82,960	50,161	50,161	20,901	50,161	20,901
Pseudo R^2	0.0877	0.057	0.058	0.064	0.058	0.063
Panel B: Marginal Effects						
$\partial \Pr(Acq)/\partial CashDev$		0.026***	0.043***		0.025***	
		(8.072)	(4.786)		(5.055)	
$\partial \Pr(Acq)/\partial(CashDev*HighFinPct)$			-0.029***			
			(-2.984)			
$\partial \Pr(Acq)/\partial(CashDev*OnlyOpCash)$					0.023***	
					(2.946)	
$\partial \Pr(Acq)/\partial CashDev\|_{HighFinPct=0}$				0.046***		
				(4.936)		
$\partial \Pr(Acq)/\partial CashDev\|_{HighFinPct=1}$				0.011***		
				(3.082)		
$\partial \Pr(Acq)/\partial CashDev\|_{OnlyOpCash=0}$						0.026***
						(5.123)
$\partial \Pr(Acq)/\partial CashDev\|_{OnlyOpCash=1}$						0.044***
						(6.945)
Joint Test			0.0137	0.0347	0.0481	-0.0174
T-Stat			(2.912)	(3.666)	(6.817)	(-2.556)

t-statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%.

Take away: Firms that have cash from financing activities are less likely to bid even with large amounts of cash on their books.

Table 1.4: Announcement Returns

Table 1.4 reports the results of cross-section regressions in which the dependent variable is the 3-day cumulative return around an announcement of M&A activity (-1,0,1). $CashDev$ is the cash deviation from the cash management model from Harford (1999). $PctFinCash$ and $PctOpCash$ are the percentage of cash coming from financing and operational activities. $HasFinCash$ is a dummy indicating that the firm's holdings of cash from financing activities are greater than zero. $HighFinCash$ is a dummy indicating that that the firm's percentage of cash from financing activities are in the top quartile of the distribution. The other controls are listed in section 2.6 and their construction details are available in the variable appendix. The internet appendix presents the full version of this table.

	Dependent Variable: $Car(-1,1)$					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
$CashDev$	-0.023***	-0.027***	-0.036***	-0.016**	-0.013**	-0.010
	(-9.122)	(-2.911)	(-3.669)	(-2.449)	(-1.963)	(-1.615)
$CashDev * PctFinCash$		0.019**				
		(2.474)				
$CashDev * HasFinCash$			0.027***			
			(3.516)			
$CashDev * HighFinCash$				0.020***		
				(3.476)		
$CashDev * PctOpCash$					-0.016*	
					(-1.685)	
$CashDev * OnlyOpCash$						-0.026***
						(-2.780)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Interacted Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,630	7,148	7,148	7,676	7,148	7,148
R-squared	0.053	0.065	0.065	0.069	0.064	0.042

t-statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%.

Take away: Firms that have cash from financing activities do not destroy value when making acquisitions. The agency problems associated with large cash holdings only apply to firms holding large amounts of cash from operations.

Table 1.5: Repurchases Announcement Returns

Tables 1.5 reports the regressions of 3-day cumulative returns around the announcement of a stock repurchase based on firms' characteristics. I Follow Grullon and Michaely (2004) for the variable construction. CAR is the cumulative return for the 3 days surrounding the announcement (-1,0,1). All dependent variables are deflated by total assets. $C_{i,t}$ is cash and cash equivalents. $PctFinCash_{i,t}$ is the percentage of cash holdings from financing activities. $HasFinCash_{i,t}$ is a dummy indicating that the firm has some cash from financing activities. $HighFinCash_{i,t}$ is a dummy indicating that the percentage of cash the firm is holding is in the top quartile of its distribution. $PctOpCash$ is the percentage cash holdings from operations. $OnlyOpCash$ is a dummy indicating that the firm only has cash from operations. The other controls are listed in section 2.6 and their construction details are available in the variable appendix. The internet appendix presents the full version of this table.

Panel A: All Firms

	Dependent Variable: $CAR(-1,1)$					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
$C_{i,t}$	0.020***	-0.056***	-0.043**	-0.050***	-0.019	-0.029*
	(2.797)	(-3.015)	(-2.326)	(-3.118)	(-1.186)	(-1.903)
$C_{i,t} * PctFinCash$		0.046**				
		(2.453)				
$C_{i,t} * HasFinCash$			0.020			
			(1.385)			
$C_{i,t} * HighFinCash$				0.046***		
				(3.079)		
$C_{i,t} * PctOpCash$					-0.044**	
					(-2.541)	
$C_{i,t} * OnlyOpCash$						0.000
						(0.024)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Interacted Controls	No	Yes	Yes	Yes	Yes	Yes
Industry Fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,837	3,562	3,837	3,837	3,562	3,562
R-squared	0.036	0.105	0.104	0.106	0.105	0.103

t-statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%.

Take away: Firms with more cash from financing activities present positive announcement returns to their share repurchases. Firms with more cash from operations actually present negative returns (contrary to the existing literature)

Table 1.6: Probability of Repurchase

Table 1.6 reports probit regressions and logit regressions with firm fixed effects of a dummy indicating the firm had a repurchase that year on measures of overvaluation and interaction terms with our variables of interest. I follow Rhodes-Kropf, Robinson, and Viswanathan (2005) to construct the overvaluation variables. $Firm-Specificerror$ is the deviation of market value from the estimated intrinsic value. $Time-SeriesError$ is the deviation of the estimated intrinsic value from the average estimated value (which is called Long-run Value). $Long-runValuetoBook$ is the deviation of the Long-run Value from the current book value. *High Cash* is a dummy variable indicating that the firm year is in the top quartile of the cash holding distribution of its industry. $PctC_{Fin.}$ indicates the percentage of the current cash holdings that come from financing activities. Similarly, $PctC_{Op.}$ indicates the percentage that come from Operations. The other controls are listed in section 2.6 and their construction details are available in the variable appendix. The internet appendix presents the full version of this table.

	Dependent Variable: *Repurchase*(0 1)					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Firm-Specific Error						
Firm-Specific Error	-0.043***	-0.043**	-0.018	-0.066	-0.020	-0.062
	(-2.812)	(-2.560)	(-0.961)	(-1.193)	(-1.060)	(-1.115)
*Firm-Specifi Error*HighCash*		-0.013	0.047	0.013	-0.092*	-0.087
		(-0.418)	(0.978)	(0.095)	(-1.915)	(-0.620)
*Firm-Specifi Error*HighCash*PctC*$_{Fin.}$			-0.161**	-0.010		
			(-2.151)	(-0.044)		
*Firm-Specifi Error*HighCash*PctC*$_{Op.}$					0.152*	0.177
					(1.803)	(0.773)
Observations	54,799	54,855	48,571	15,144	48,571	15,144
Pseudo R2	0.0553	0.0417	0.0562	0.0543	0.0571	0.0553
Panel B: Time-Series Error						
Time-Series Error	-0.060	0.221***	-0.038	-0.292**	-0.034	-0.286**
	(-1.428)	(5.286)	(-0.753)	(-2.300)	(-0.681)	(-2.248)
*Time-Series Error*HighCash*		-0.401***	-0.091	-0.320	-0.507***	-1.215***
		(-4.451)	(-0.714)	(-1.010)	(-3.477)	(-3.576)
*Time-Series Error*HighCash*PctC*$_{Fin.}$			-0.466**	-1.015*		
			(-2.084)	(-1.897)		
*Firm-Specifi Error*HighCash*PctC*$_{Op.}$					0.516**	1.104**
					(2.231)	(1.968)
Observations	54,799	54,855	48,571	15,144	48,571	15,144
Pseudo R2	0.0550	0.0426	0.0567	0.0569	0.0576	0.0578
Panel C: Long-run Value to Book						
Long-run Value to Book	0.061**	-0.079***	0.089***	0.286***	0.086***	0.290***
	(2.309)	(-3.035)	(2.860)	(3.452)	(2.767)	(3.497)
*Long-run Value to book*HighCash*		0.024	-0.003	0.214	-0.145**	-0.300
		(0.396)	(-0.047)	(1.104)	(-1.966)	(-1.211)
*Long-run Value to book*HighCash*PctC*$_{Fin.}$			-0.140*	-0.668*		
			(-1.903)	(-1.686)		
*Long-run Value to book*HighCash*PctC*$_{Op.}$					0.185**	0.610
					(2.504)	(1.642)
Observations	54,799	54,855	48,571	15,144	48,571	15,144
Pseudo R2	0.0552	0.0418	0.0565	0.0559	0.0574	0.0567
Controls	Yes	Yes	Yes	Yes	Yes	
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	No	Yes	No
Firm Fixed Effects	No	No	No	Yes	No	Yes

Robust z-statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%.
Take away: The positive announcement returns to their share repurchases are a result of timing the market better. The bad results of firms with large cash holdings from operations is because of poor timing.

Table 1.7: Returns on Cash

Table 1.7 reports the results of the regressions found on tables 1.3 and 1.4 adding an interaction with the returns on cash. Panel A reports the results of probit regressions on the probability of bidding. Panel B reports the 3-day announcement returns cross-section regressions. *Ret. on Cash* is Interest and Related income normalized by total assets. The other controls are listed in section 2.6 and their construction details are available in the variable appendix.

	Panel A: Prob. of Bidding			Panel B: Ret. on M&A	
	Dep. Var: Acq (0 1)			Dep. Var.: CAR(-1,1)	
VARIABLES	(1)	(2)		(3)	(4)
CashDev	0.102***	0.106***		0.002	0.003
	(2.690)	(2.584)		(0.239)	(0.634)
CashDev ∗ *PctOpCash*	0.611***	0.523***		-0.031*	-0.031***
	(6.810)	(6.169)		(-1.741)	(-2.613)
CashDev ∗ *PctOpCash* ∗ *Ret. on Invest.*	-1.161***	-1.189***		0.056**	0.056***
	(-3.721)	(-3.757)		(2.392)	(2.958)
Controls	Yes	Yes		Yes	Yes
Year Fixed Effects	Yes	Yes		Yes	Yes
Industry Fixed Effects	No	Yes		No	Yes
Observations	31,681	31,681		2,337	2,337
Pseudo R2	0.0521	0.0590	R^2	0.034	0.038
Marginal Effects For Probit Model					
$\partial \Pr(Acq)/\partial CashDev$	0.014***	0.014***			
	(2.699)	(2.599)			
$\partial \Pr(Acq)/\partial(CashDev*PctOp.Cash)$	0.084***	0.071***			
	(7.004)	(6.292)			
$\partial \Pr(Acq)/\partial(CashDev*PctOp.Cash*Ret. \ on \ Invest.)$	-0.159***	-0.162***			
	(-3.726)	(-3.759)			

t-statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%.

Take away: When returns on their short-term investments are higher, firms with more cash from operations perform better on their M&A activities

Variable	Description	Calculation using Original Data Set variable
Panel A: Excess Cash Flows Data Set		
$CashDev$	Excess Cash calculated using the Harford's (1999) methodology	Details on subsection A.1 of section VII
$PctFinCash$	Percentage of Cash coming from Financing activities	$CashfromFin/(CashFromFin+CashFromOp+CashfromInv)$
$PctOpCash$	Percentage of Cash coming from Operations	$CashfromOp/(CashFromFin+CashFromOp+CashfromInv)$
$HasFinCash$	Dummy Variable equals 1 when $PctFinCash > 0$	
$HighFinCash$	Dummy Variable equals 1 when $PctFinCash$ is in top quartile	
$OnlyOpCash$	Dummy Variable equals 1 when $PctOpCash$ equals 1	
PanelB: COMPUSTAT		
$CashHoldings$	Total Cash Holdings	che
$ChangesinCash$	Changes in Total Cash Holdings	$che - che_{t-1}$
$NetWorkingCapital$	Non-Cash Net Working Capital	$(act - lct - che)/at$
$SaleGrowth$	Sales Growth	$(sale_t - sale_{t-1})/sale_{t-1}$
$Leverage$	Market Leverage	$(dlc + dltt)/(prcc_f * csho)$
$Market - to - book$	Market to Book Ratio	$(prcc_f * csho)/(at - lt - mib)$
$Price - to - Earnings$	Price to Earnings Ratio	$prcc_f/epspi$
$Size$	Firm's size	$log(at)$
$Ab.Return$	12 month buy and hold return using the 5X5 Fama-French size and MB Portifolio	12 month buys and hold return - 12 month buy and hold return of FF 25 portifolio
$Profitability$	Income plus depreciation over total assets	$(ib + dp)/at$
Age	Number of years after IPO	
$ReturnonAssets$	Returns on Assets	ib/at
$Ret.OnInvest$	Interest income over short term investments	$idit/ivst$
Panel C: SDC		
$PSOUGHT$	Percentage of shares announced to be repurchased	$pct_shs_auth_latest_auth_date/100$
$AllCash$	All Cash Merger & Acquisition	$pctcash = 100$

Chapter 2

Back in Style: Contrasts in Style and CEO Impact on Corporate Policy

2.1 Introduction

The growth in CEO compensation has been in the center of the corporate finance literature [1]. The financial crisis stimulated this discussion and brought it to the newspapers' front page. After the financial crisis, CEO costs and benefits were extensively discussed, with no definitive answer. Important questions related to the relevance of CEOs remain unanswered: Are there significant differences between the ways CEOs run the firms? Do these differences provide a competitive edge for the firm? Would the firm's corporate policies be significantly different if another, and perhaps less expensive, CEO was in office?

Many studies have used different methods to determine the CEO's impact on performance and corporate policies. In their seminal paper, Bertrand and Schoar (2003) use an F-test on a set of CEO fixed effects calculated using a panel of executives in order to measure this impact. They found that the CEOs preferences (style), can explain the heterogeneity of the

[1] see for example Bebchuk and Grinstein (2005), Kaplan (2008) and Jensen, Murphy, and Wruck (2004)

different firm's corporate policies (investment, financial, and organizational). Other papers have found that CEO style affects the firm's accounting Bamber, Jiang, and Wang (2010) and tax practices Dyreng, Hanlon, and Maydew (2010), CEO compensation Graham, Li, and Qiu (2012), leverage choice Frank and Goyal (2007) and performance volatility Adams, Almeida, and Ferreira (2005).

In a recent paper, Fee, Hadlock, and Pierce (2011) challenge the previous results in the literature, criticizing the use of F-tests on three different grounds: (1) biases, (2) serial correlation and (3) warning about the validity of the F-test in panel data with an exploding N. In their paper found on Wooldridge (2010), they propose restricting the analysis to a sub-sample of turnovers considered exogenous to solve the bias problem and suggest a new test to overcome the F-test problems. They do not find evidence of CEO style affecting a firm's corporate policy. Therefore, at this point there is no consensus on whether CEOs heterogeneous preferences could explain a firm's corporate policy variation.

The tests used by the existing literature are only capable of providing a yes or no answer to the influence of the systematic difference between CEOs on corporate policy. This is specially problematic when we are considering an exogenous turnover. In these instances, the firm should not be unsatisfied with the current CEO, and would probably be seeking someone very similar. In this way, these tests might lead to incorrectly assert that there are no differences between CEOs, and therefore there is no CEO style.

In this paper, we suggest an additional step to analyze policy changes around a turnover. To the best of our knowledge, no paper tried to provide a measure for the CEO style and directly quantify its effect on the firm's policy. We explore the differences between the exiting and new CEOs' styles to evaluate their impact on corporate policy. The intuition behind this measure is that changes should be more dramatic in the firm's policies if the new CEO has very different preferences than the CEO who is leaving. On the other hand, changes should be less pronounced in firms where the exiting and the new CEO share precisely the same view.

We explore this framework using a two-step model. In the first step, we calculate CEO fixed-effects. Similar to Bertrand and Schoar (2003) we construct a panel of CEOs of firms that had at least one of their CEOs observed in two different firms. This panel allows us to separate the CEOs' fixed effects and the firm's fixed effect. In the second step, we quantify the impact of the CEO on the changes in firm's policy by regressing the policy variables on the differences between the estimated fixed-effects of the exiting and the incoming CEOs. This two-step procedure allows us to quantify the effects of CEO's preferences (style) on corporate policy at the time of their arrival to the new firm. In contrast to the previous suggested tests, our method provide the extent and the direction we should expect the CEO to change the policy to be: If we are seeing a low leverage CEO being replace by a high leverage CEO, we should observe an increase in leverage in that firm after the turnover. In addition, our measure is just a one year shock to the policy, which mitigates the criticisms about serial-correlations raised by Fee, Hadlock, and Pierce (2011).

We find that firms that replace their manager by someone with a very different style present a more pronounced change in their policy. This is true for all the policies we consider in our analysis. Our results are also economically significant. For instance, our model predict that a firm that replace their CEO with someone that prefer his leverage level 10% higher than the exiting CEO, should experience a change of 4.7% change in their policy right in the year of the turnover.

The fact that the difference in the styles is correlated with the change is consistent with matching theory. Firms seem to be choosing CEOs with specific skills to do the job based on what they expect for the future of the firm. The endogenous matching raise concerns about the estimators of CEO impact on corporate policy. If firms are anticipating the policy changes needed, we could observe the same results in the absence of the turnover, or even if we replaced this CEO be any other CEO we would find the same results. In order to further investigate the endogenous matching we analyze how our results change in the sub-sample of turnovers classified as exogenous. If these turnovers were truly exogenous they would mitigate at least partially the bias on our estimates. For this reason, the estimators for this group would be smaller than for the whole sample of turnovers. Our results reject the exogeneity of the sub-sample. Our results remain largely unchanged for these sub-sample. The only estimates that are reduced are the estimates for Asset Growth. For all the other policies we are analyzing, the effect of the whole sample and the sub-sample of exogenous turnovers are exactly the same. This results reinforce the idea of endogenous matching. Even for the cases in which the CEO exited for unforeseeable reasons the firm carefully selected the CEO

replacement.

We conduct our analysis in a number of steps. In Section 2.2, we present the data necessary for our analysis, explain our hand collection process to obtain the reason for the exit and present the summary statistics of the main variables we will use in our analysis. In Section 2.3, we study the characteristics of firm's turnovers. We compare firms undergoing internal turnovers, external turnovers, with firms in normal times. We observe that turnovers are associated with the firm's performance and that external turnovers seem to be even more critical than internal turnovers. We then use the information obtained from our hand collected data and define a sub-group of turnovers in which it is less likely that an unobservable factor is affecting both the policy and the probability of the turnover. We classify exogenous turnovers cases where the reasons listed are: death, illness, outside offer, or the CEO remained in the firm in a different position. This classification guarantees that either the turnover was unplanned or was part of a friendly succession plan, which mitigate the probability that there is an unobservable factor influencing both the policy and the probability of the exit.

In section 2.4 we revisit the joint tests used in the literature of CEO fixed effects to select which variables we will use in our analysis. Fee, Hadlock, and Pierce (2011) point out several problems with the F-tests, however they never suggest an alternative that would allow us to correctly do the joint tests. They offer a test for the evaluation of the impact on the mean and variability of the residuals of the firm's policy. We will argue that this tests

have a low power, because it is not clear that we need the distributions to change in order to observe CEO fixed effects. The residuals could be drawn from the same distribution and yet firms present changes in their policy. Therefore, while Bertrand and Schoar (2003) has a high false positive rate, Fee, Hadlock, and Pierce (2011) has a low probability of rejecting the null when it is actually false. We explore two joint tests that control for the *multiplicity issue* that invalidate the F-test. Instead of providing a yes or no answer to the joint test, this procedures provide the percentage of CEOs for which we can reject the null, controlling for the possibility of a rare event. We find that only dividends, interest coverage and advertising expenses fail to present an substantial amount of rejection in their test. All the other variables considered present more than 25% of their CEOs rejecting the null that their fixed effects are equal to zero. As a consequence of this results we drop dividends, interest coverage and advertising expenses from our main analysis. In section 2.6 we present our main results. In section 2.7 we present our concluding remarks.

2.2 Data

Our data set comes from three pieces of data. The firm's financial information comes from the COMPUSTAT files. All variables considered here are deflated to 1990 value. We follow the standard filters of the literature: We drop financial (SIC between 6000 and 6999), utilities (SIC between 4900 and 4949) and quasi-public firms (SIC greater than 8880). We also drop small firms (Total assets less than $ 10 million dollars or Property, Plant and Equipment less than $ 6 million dollars), and observations that seem to have measurement errors, i.e. firms

with excessive (more than double in a year) growth in their Property, Plant and Equipment, Total Assets and Sales are dropped. We also drop firms with missing total assets or missing market-to-book ratio. Finally, we drop firms with negative market-too book ratio. We winsorize all variables in our analysis at the 0.1% level.

The CEO information is coming from EXECUCOMP, and we restrict our attention to CEOs. We initially obtain every CEO turnover available in the data. We check the cases in which the CEO could be observed prior in the data and label this cases external turnovers. To avoid mislabeling, only after we define all turnover cases we merge this data with the financial information.

To diminish the biases associated to turnovers, we hand collect data on the reasons why the CEO left the firm and define a sub-group of turnovers in which it is less likely that an unobservable factor is affecting both the policy and the probability of the turnover. We search a Wall Street Journal database, for the first and last name of the former and new CEO, the name of the firm and the date of the turnover. We then read between 2 and 4 (depending on availability) articles about the turnover and capture a few key words about it.

Table 2.3 presents the results of the hand collection process. We were able to find news on 379 external (outside hire) turnovers. We find that around 32% of the turnovers explicitly say that the CEO resigned or was forced out of the firm. Around 25% of the observed external turnovers where due to retirement. And for another 26% the CEO stayed in the firm performing a different activity (for instance, chairman of the board). We still observe

a few other reasons for the turnovers, such as outside offer, death, illness and corruption scandal that total 7% of our cases. We also are unable to identify the reason of the turnover for around 10% of our sample.

Table 2.7 present the summary statistics for the main variables considered in this study. We present the summary statistics separate for each piece of data considered in this paper. We start in column (1) presenting the sample of all COMPUSTAT companies for the years between 1992 and 2010. In Column (2) we narrow the sample for the firms we were able to match with the EXECUCOMP dataset, this is the sample we will be considering for our analysis (treatment and control). Column (3) presents the summary statistics of firms undergoing an external turnover (treated - not exogenous). Column (4) presents the summary statistics for a sub-sample of firms undergoing external turnovers that we classify as exogenous. None of the variables considered here have statistically significant differences across the groups. We will discuss more about the differences across groups (3) and (4) in the next section.

2.3 What drives turnovers?

Disentangle the CEO's preferences from the "firm's preferences" is a very challenging process. It is very hard to see what is influencing the decision, a firm characteristic or a CEO characteristic. In order to try to separate the two, the literature has relied on turnovers. In addition to that, in order to really separate the actions of the firm and the actions of the CEO, we need to observe the CEO in two different firms Bertrand and Schoar (2003).

The assumption behind the idea of using turnovers is that nothing is changing in the firm, except the manager. However, Fee, Hadlock, and Pierce (2011) point out that it might not be reasonable to use them: a turnover is a very sensitive time of a firm (e.g. Murphy and Zimmerman, 1993; Denis and Denis, 1995), in general associated with poor performance (e.g. Weisbach, 1988; Warner, Watts, and Wruck, 1988). It is very costly to fire a CEO Taylor (2010) and it rarely happens (e.g. Kaplan and Alcamo Minton, 2006; Huson, Parrino, and Starks, 2001), and it is usually associated with bad firm or industry performance (e.g. Kaplan and Alcamo Minton, 2006; Huson, Parrino, and Starks, 2001; Weisbach, 1988; Warner, Watts, and Wruck, 1988). External turnovers are an even more dramatic situation for a firm (e.g. Parrino, 1997; Huson, Parrino, and Starks, 2001). Not only the firm decided to change the CEO, but the board of directors decided that no one inside the firm's ranks was capable of taking over the job (most commonly an executive from inside is selected). Therefore we are dealing with a very specific occasion where it might not be feasible to separate what is been driven by the firm's current situation from what is been driven by the CEO's preferences.

In order to put numbers to this explanation, we ran a multinomial logit model in order to compare firm years with no turnovers, with firm years with internal turnovers and firm years with external turnovers. Our Dependent variable is as follows:

$$Dep.Var. = \begin{cases} 0 & \text{No Turnover} \\ 1 & \text{Internal Turnover} \\ 2 & \text{External Turnover} \end{cases} \tag{2.1}$$

Table 2.2 presents the results of the multinomial logit regressions. No turnover is the base for the analysis. Column (1) shows the correlations for external turnovers, while column (2) shows the correlations for internal turnovers. The results indicate that both kinds of turnovers are a delicate moment in the firm's life. However, as we expected it seems that external turnovers are more extreme. Firms with low asset growth are more likely to go through an external turnover. On the other hand, firms with low asset growth, lower returns on asset and higher leverage are more likely to make e external turnover. Our results show that external turnovers are associated to a more extreme situation. A good anecdotal example of a firms that are going through external turnovers is Yahoo!. They had 5 turnovers in the past 5 years (between 2007 and 2012), the past three CEOs came from other firms (Carol Bartz from HP, Scott Thompson from PayPal, and their current CEO Marissa Mayer from Google). They are an anecdotal evidence that when a firm resort on outside hire it really means that the situation of the firm is unstable. The results of the multinomial logit regressions are consistent with Fee, Hadlock, and Pierce (2011) and indicate that using external turnovers might not allow us to truly separate the impact of the CEO from a unobservable factor that is affecting both the policy and the likelihood of the turnover.

Next, we determine what would be the instances that we would consider exogenous. Our main concern was with the fact that firms are aware of the negative consequences that a turnover has, and for this reason they could be trying to hide the true reason for the change. Deceases [2], illness, and outside offers Hayes and Schaefer (1999) are the most obviously

[2]Other papers explore these turnovers, for example: Bennedsen, Perez-Gonzalez, and Wolfenzon (2007), Bruce Johnson, Magee, Nagarajan, and Newman (1985), Hayes and Schaefer (1999), Salas (2010) and Slovin

exogenous and would be very unlikely faked by the company. However, we only 7% of the cases fall in these three categories. Thus, we needed to incorporate other reasons to increase our sample of turnovers. Fee, Hadlock, and Pierce (2011) use "natural retirements" in which they find no evidence that the CEO was forced out [3]. Although we think this is appropriated for some of the cases, we think that this selection is subjected to errors. Figure 2.1 shows the distribution of the retirement age. CEOs retire as early as 48 years old and as late as 71. Some firms could for example wait too long, to the point that the productivity of the CEO is low for a couple of years. Knowing that the CEO is at retirement age would increase the firm's incentive to dress a forced retirement (due to decreasing productivity) as a natural one. For this reason, beside death, illness and outside offers we only consider exogenous the cases in which the CEO remains in the firm in a different activity (for example chairman of the board). This way we are sure that the firm is reasonably satisfied with the CEO, to want to keep her in the firm's ranks. This way, these turnovers would be more of a natural succession process. In addition to that, staying in the firm will ensure that the CEO is liable to any of her decisions prior to leaving the helm.

In order to provide evidence that the turnovers we consider here are truly not related to firm performance we make a informal test of the quality of the turnover. We run a multinomial logit with the following dependent variable:

and Sushka (1993)

[3]Natural Retirements are also used in Denis and Denis (1995)

$$Dep.Var._{\cdot 2} = \begin{cases} 0 & \text{No Turnover} \\ 1 & \text{Exogenous Turnovers} \\ 2 & \text{Non Exogenous Turnovers} \end{cases} \tag{2.2}$$

We are calling our second category "Non Exogenous Turnovers" to indicate that this is the group that was not classified as exogenous according to our methodology. We are acknowledging that there might be cases that were truly exogenous but we did not classify them as exogenous due to the rigor of our classification.

Table 2.4 presents the results of the multinomial logit regressions. None of the performance measures considered helped explain exogenous turnovers. This is only a informal test, because we are mainly concerned with unobservable variables and cannot see their differences between the two groups. However, this is an indication that we are dealing with turnovers that are not associated to the situation of the firm, but a natural transition inside the firm.

2.4 Selecting Variables of Interest: Joint Significance Tests

The two ways previously used in the existing literature to measure the existence of CEO heterogeneity are F-tests Bertrand and Schoar (2003) and changes in the mean and variability ration of the residual of firm's policy around the announcement of the turnover Fee, Hadlock, and Pierce (2011). Fee, Hadlock, and Pierce (2011) point out different problems of estimating CEO heterogeneity using the F-tests. The main criticism of the F-test is the *multiplicity issue* of joint significance test. The *multiplicity issue* is the fact that when we

increase the number of hypothesis being tested simultaneously, the probability that we will encounter a rare results increases. For instance, when testing 10 different hypothesis at a 5% level, there is more than 40% chance of having one or more type I errors. Since in the CEO fixed effects we are dealing with thousands of hypothesis, the probability of getting a type I error is close to one. This way, the results will not reflect a true rejection of the null hypothesis, but simply the existence of an outlier in our analysis.

Fee, Hadlock, and Pierce (2011) nicely point out this issue, and show in several different falsification tests that the results are extremely inconsistent. However, the alternative tests suggested by them have a very low power. Their tests compare the mean and the variability ratio of the residual of the corporate policy, before and after the turnover. The problem of testing the mean is pointed out by them in the paper, while we expect changes, it is not clear that we should observe every new ceo moving in the same direction: some of them will increase the policy and others will decrease it, possibly generating no changes in the mean. More generally, it is not clear that we need this distribution to change in order to find evidence, we could have the error terms drawn from the same distributions and yet observe individual changes in the policy.The same argument is valid for the variability test, when they divide the residual of the firm by the residual of a matched firm, if we are still drawing from the same distribution we do not necessarily need to see changes on average to guarantee the existence of CEO heterogeneity.

Our measure will try to address the problems with the low power of the tests found on

Fee, Hadlock, and Pierce (2011), however, before we move to the main analysis, we will revisit joint tests of CEO heterogeneity correcting for the multiplicity issue. Chapter 3 of Efron (2010) has an extensive explanation on the *multiplicity issue* and how to correct for it. Here we are summarizing the ideas presented in this chapter of the book, for a more detailed explanation please refer to Efron (2010).

The Family-Wise Error rat or FWER is defined as the probability of makint at least one false rejection in a family of hypothesis-testing problem.

$$FWER = Pr\{\text{Reject any true } H_{0i}\} \tag{2.3}$$

The FWER control procedures we will use are algorithms that inputs a family of p-values $(p_1, p_2, ..., p_N)$ and outputs the list of accepted and rejected null hypotheses, subject to the constraint:

$$FWER \leq \alpha \tag{2.4}$$

We will consider two procedures suggested at Efron (2010), chapter 3: Bonferroni's and Holm's (stepwise) procedures. The classic FWER control method is the Bonferroni's bound, in which we reject those null hypothesis for which:

$$p_i \leq \alpha/N \tag{2.5}$$

We will use the *Šidák procedure*, which improves on the Bonferroni bound by rejecting those hypotheses H_{0i} for which:

$$p_i \leq 1 - (1 - \alpha)^(1/N) \tag{2.6}$$

In addition we will use a more elaborate test called *Holm's procedure*: let te ordered p-values be denoted by

$$p_{(1)} \leq p_{(2)} \leq p_{(3)} \leq \ldots \leq p_{(N)} \tag{2.7}$$

We will reject $H_0(i)$, the hypothesis corresponding to $p_(i)$, if

$$p_{(j)} \leq \frac{\alpha}{N - j + 1} \text{ for } j = 1, 2, \ldots, i \tag{2.8}$$

Table 2.5 present the percentage of CEO fixed effects that reject the null hypothesis that there is no CEO heterogeneity. We separate the results in three panels. In the first panels we consider all CEOs turnovers. It is important to emphasize that we are dealing with a panel of CEOs who belong to firms that have at least one manager who is observed in two different firms. In the second panel we focus on the CEOs that can be observed in two different firms. For this cases, we can separate the CEO fixed effects from the firm fixed effects. Finally, we focus on the CEOs that are observed in two different firms and for which the exit of the formal CEO was classified as exogenous (death, illness and natural retirements).

Columns (1), (4) and (7) of table 2.5 show the results for a simple t-test on the coefficient. This resulst are subjected to the *multiplicity issue* and as expected, except for dividends and Advertising Expenses, all the variables present the majority of the CEOs presenting a signif-

icant fixed effect. Columns (2), (5) and (8) presents the results using Bonferroni's procedure, while columns (3), (6) and (9) present the results for the Holm's procedure. The contrasts between the t-test results and the results adjusting for FWER show that there is a large effect of outlier in the original Bertrand and Schoar (2003) results. Nevertheless, even after controlling for FWER we still get a substantial amount of CEOs rejecting the null hypothesis that there is no heterogeneity. The results are largely robust when we focus on the subsample of exogenous turnovers, which means that even for this cases we would still observe CEO fixed effect for a substantial fraction of the sample.

The purpose of this section is to select the variables we will use in our analysis, based on the variables that actually seem to be presenting CEO fixed effects. It is important to say that after controlling for FWER, if we find 1 manager that affects the policy, we would be able to reject the null that CEOs don't matter. All our variables pass this criteria. However, as a practical matter we will drop the variables with less than one quarter of the CEOs affecting the policy as we are not observing a lot of CEO heterogeneity in this variables. For this reason, we are dropping Dividends, Interest Coverage and Advertising Expenses policies and claim that we did not find a strong evidence of CEOs influencing this variables beyond the firm characteristics.

2.5 Fixed Effects Differential

In addition to the challenge of separating turnovers that would allow us to identify the differences between the firm's maximization problem and the CEO impact, it is also difficult to determine a precise measure for this impact. The standard way of testing CEO styles was through F-tests. However, besides the endogeneity problem discussed above, Fee, Hadlock, and Pierce (2011) point out that F-tests are not appropriate due to serial-correlations. They run a series of falsification tests and show that the significance in the F-test results might be spurious. Finally, they advert to warning about the validity of F-test "*on an asymptotically exploding number of dummy variables in a non-normal setting*" Wooldridge (2010). they propose a regression model to capture all the other factors not related to the CEO style. They then test for CEOs' style comparing the standard error of the residuals of firms undergoing exogenous turnovers and matched firms in normal times. They find no evidence of CEO style.

Both tests suggested in these papers can only provide a yes or no answer to the influence of CEOs' heterogeneity on corporate policy. We develop a new methodology to try to capture the CEOs impact on a firm's corporate policy. We argue that both ways previously used in the literature lack a measure of the contrast between the new and the former CEO. We should observe a more acute impact in turnovers where the new CEO has an extremely different view than the exiting one, than in turnovers involving CEOs with similar views. For this reason, we develop a measure to compare the differences between the CEOs' views. In order to capture that, we use a very simple rational (already available on Fee, Hadlock,

and Pierce (2011)) derived from a equation in differences. Let the level of a given corporate decision variable be defined as follows:

$$y_{i,t} = \beta X_{i,t-1} + \delta_t + \mu_i + \mu_e + \epsilon_{i,t} \tag{2.9}$$

Where $y_{i,t}$ is the corporate policy (such as leverage, Investment, R&D expenses, etc.), $X_{i,t-1}$ is a set of time-varying controls that include the industry's average for the same year and other firm specific controls, δ_t are the year's fixed effects, μ_i are the firm's fixed effects and μ_e are the executive fixed effects. If we take the first difference of this model will get the following:

$$y_{i,t} = \beta X_{i,t-1} + \delta_t + \mu_i + \mu_e + \epsilon_{i,t} \qquad (-)$$

$$y_{i,t-1} = \beta X_{i,t-2} + \delta_{t-1} + \mu_i + \mu_{e'} + \epsilon_{i,t-1}$$

$$\Delta y_{i,t} = \gamma \Delta X_{i,t-1} + \Delta\delta_t + (\mu_e - \mu_{e'})\Delta\epsilon_{i,t}$$

During the normal times $(\mu_e - \mu_{e'}) = 0$ while during a turnover it could be different than zero. This equation point out the fact that in order to observe any changes in the policy due to the CEO we need a contrast between the CEOs. If both CEOs have the exact same view about that particular policy we should not observe any changes. In addition to that this measure will allow us to have some predictability about the direction of the impact of a CEO once he enters the firm.

In order to capture that we develop a two-step procedure. In the first step we estimate the CEO fixed effects for the exogenous turnovers classified according to the previous section using equation 2.9. The first-step will provide us $\hat{\mu}_e$. Subsequently, in the second step we use the estimated CEO fixed effects to measure the impact of the CEO in several corporate polices using three different specifications in the first one we analyze the changes on the year of the turnover.

$$\Delta y_{i,j,t} = \gamma \Delta X_{i,j,t-1} + \beta_1 (\hat{\mu}_{e'} - \hat{\mu}_e)_t + \delta_t + \epsilon_{i,t} \tag{2.10}$$

This way we will observe if there was a change right after the CEO arrival. In this specification we are trying to get a one year shock to the policy that was caused by the CEO. $(\hat{\mu}_{e'} - \hat{\mu}_e)_t$ is capturing the impact on the year of the CEO arrival. In general, the CEO arrives sometime during the year, therefore in year t she will be in the helm for only a fraction of the year. Following the existing literature we also have an alternative specification in which we give the CEO three years to establish his style:

$$\Delta y_{i,t} = \gamma \Delta X_{i,t-1} + \tau \sum_{k=0}^{i=2} [(\hat{\mu}_{e'} - \hat{\mu}_e)]_{t-k} + \delta_t + \epsilon_{i,t} \tag{2.11}$$

This way we will see if the average behavior of the new CEO in her initial years will differ from the rest of the sample. It is important to note that we run the second stage models on levels and not differences, to allow us we included the firm's fixed effects in our regressions.

There is an important caveat to our methodology. In order to do precisely what we want

to do, we would need to have both the former and the new CEO observed in different firms. This way we would truly be observing the CEO characteristic separated from the firm's characteristic. However, we are only able to observe the new CEO in two different positions. The number of cases in which we can actually observe both executives in different firms is very small and would not allow us to estimate the impact. For this reason what we are truly measuring is the difference between the new CEO fixed effects separated from the firm and a mixture of the exiting CEO fixed effect and the firm fixed effect for the period she CEO was in charge.

In order to evaluate how our results change for the subsample of turnovers in which the exit of the former CEO was labeled exogenous, we interact our main variables with an indicator of exogenous turnovers as follows:

$$\Delta y_{i,j,t} = \gamma \Delta X_{i,j,t-1} + \beta_1(\hat{\mu}_{e'} - \hat{\mu}_e)_t + \beta_1(\hat{\mu}_{e'} - \hat{\mu}_e)_t * Exog + Exog + \delta_t + \epsilon_{i,t} \qquad (2.12)$$

This way we will be able to capture whether or not the exogenous classification is diminishing the effects and therefore removing any existing bias from our measures.

2.6 Changes in Corporate Policy Around Turnovers

In this section we will investigate how a firm's corporate policy change following a turnover depending on whether the replacement was very similar to the exiting CEO or if they were very different. The underlying hypothesis here is that we should observe more dramatic

changes in firms that replace a CEO with someone very different, while we should not expect a lot of change if the new CEO arrives to a place where his style is already in place.

Table 2.6 shows the results for the three year impact around the turnover. All the variables considered here present a significant change in firms that have a dramatic change in the style of their manager. The results are also economically significant. For instance, a firm that replaces a CEO with someone that commonly prefers investment levels 10% higher than the exiting CEO will on average experience a 3.5% increase in their investment levels right in the year of the turnover. Returns on Assets (ROA) and R&D Expenditure seem to be the most affected around the turnover.

Since there is a possible mechanical relation between $y_{i,t}$ and $\mu_{e,t}$ we also run the regressions calculating the CEO fixed effects removing year t from the calculation. This way we are in fact, removing $y_{i,t}$ and $y_{i,t-1}$ from the calculation of the fixed effect differential at year t. Panel B shows the results, even though the slightly smaller, they are qualitatively the same and the conclusion remain unchanged.

Table 2.7 provide similar results but giving the CEO three years to establish their style. The results get slightly attenuated when we average them out over three years, however the conclusion are still the same. We still observe a significant change in policy around the announcement of a more extreme management change.

Consistent with matching theory, these results are evidence that firms are selecting CEOs to do a specific job inside the firm. When the boards of directors believe that the firm should

increase their investment levels, they hire a CEO that is comfortable leading an aggressive investment policy. These raises concerns about the interpretation of the coefficients we have. With endogenous matching one should expect that the policy would have changed regardless of the CEO changes. The board of directors already know what needs to be done, and is simply hiring the correct person for the job. This way we would not be capturing the effects of CEOs, but possibly the bias on this endogenous decision.

In order to further investigate this issue, we analyze how our results are affected when we consider the classification of exogenous exit, largely used in the literature. These criteria classifies a turnover as exogenous when the CEO was not forced out, but actually left for exogenous reasons (death, illness or natural retirement). Assuming that endogenous matching is happening throughout the sample, and it is biasing our estimator, these sub-sample should be able to capture some of the bias and our estimator should be smaller for these sub-group.

The second line of panels A and B on both Tables 2.6 and 2.7 presents the results of the interaction of our main results with an indicator of exogenous turnovers. The only estimator that seems to be corrected by the classification is the estimator asset growth. All the other estimators are exactly the same for all the turnovers and the sub-group of exogenous ones. This reinforce the idea of endogenous matching. Even in the situations in which the CEO leaves for unforeseeable reasons the firm is still selecting their replacement very carefully and this is reflected on the changes that follow the turnover.

Taken all together our results imply that firms are indeed choosing their CEO, and that using exogenous exits to try to mitigate a possible endogeneity problem does not solve the problem because the selection is not only on the exit but it is also on the choice of new CEO.

2.7 Conclusions

In this paper we develop a new method to analyze the changes in corporate policies around a CEO turnover. We explore a two-step procedure in which in the first step we calculate the CEO fixed effects, and then use the differences between the fixed-effects of the exiting and the incoming CEO. Thus, we explore the contrast between the CEOs' preferences to try to differentiate firms that will have a more pronounced change, from firms that will likely remain the same. We find that firms that reach out for CEOs that are very different than the exiting one present a more pronounced change than firms that simply look for someone with similar views as those of the exiting CEO.

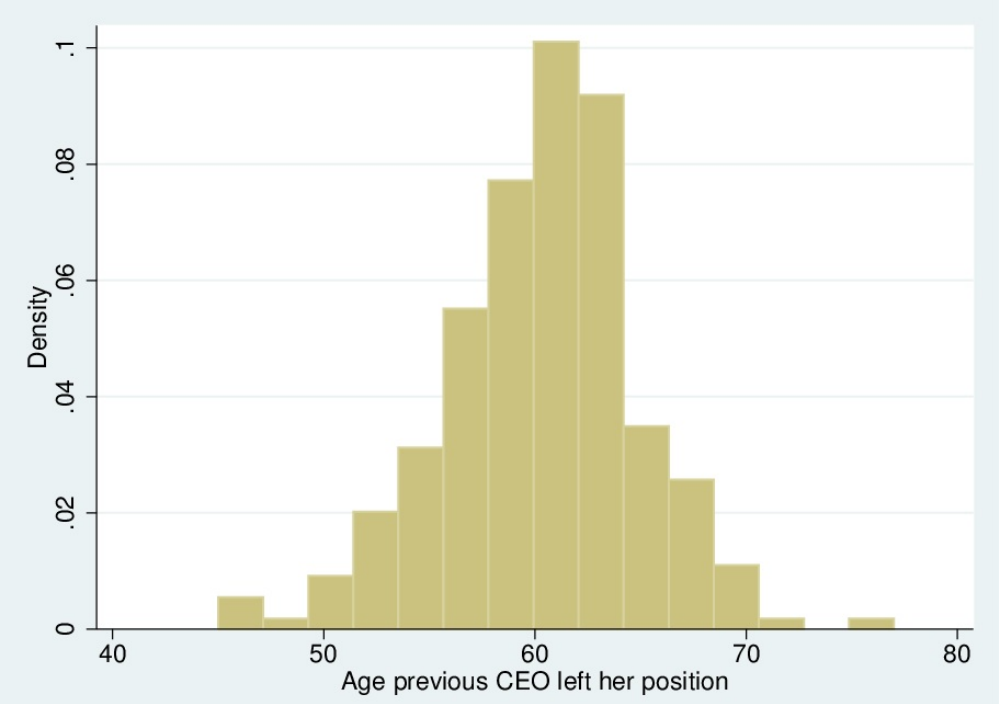
Our results provide evidence of endogenous matching between firm and CEOs. They suggest that firms are anticipating the changes needed and are hiring a CEO that is comfortable running that given policy. We find that our results remain largely unchanged when we use a sub-sample of exogenous turnover, which indicate that even in circumstances in which the CEO left for exogenous reasons, the replacement was carefully chosen by the board of directors to run a specific policy on the firm from that point on. Other two important points of the paper are one, to show that, using appropriate tests we can observe changes in policies around the announcement of the turnover. And two, provide tests of CEO hetero-

geneity that are not subjected to the F-test criticism to find that there is CEO heterogeneity. Different CEOs seem to be using different policies, beyond what could be explained by the other observable. Both of these claims are unaffected when we restrict our attention to exogenous exits. We, however, do not believe this heterogeneity is causal, as we have evidence of endogenous matching.

2.8 Figures

Figure 2.1: Retirement age distribution aroung 65 years old

This figure displays the distribution of ages at which the CEOs have retired in our data base. This picture is a clear indication that the CEO is choosing the year in which she is going to retire, therefore even retirements that were not clearly forced could have clearly been anticipated by the CEO and influenced her actions before leaving the office.



2.9 Tables

Table 2.1: Summary Statistics

This table presents the summary statistics for the main variables used in this studies. Column (1) show the firms characteristics for the COMPUSTAT world for the years between 1992 and 2010. Column (2) show the characteristics for the firms we were able to merge with EXECUCOMP database. Column (3) shows the results for firms undergoing an external turnover. Column (4) show the summary statistics for a subgroup of firms undergoing an external turnover that we classify as exogenous turnovers according to the methodology developed in section 2.3.

Variables	Compustat (1)	Compustat/ Execucomp (2)	External Turnovers (3)	Exogenous Turnovers (4)
$Size$	5.958	6.824	7.101	6.993
	(1.801)	(1.487)	(1.429)	(1.464)
$Market-to-Book$	1.41	1.665	1.384	1.554
	(1.189)	(1.326)	(0.854)	(0.95)
$CashFlow$	0.325	0.459	0.332	0.486
	(0.708)	(0.781)	(0.93)	(0.988)
$ReturnsonAssets$	0.023	0.042	0.014	0.025
	(0.085)	(0.072)	(0.08)	(0.069)
$Investments$	0.247	0.261	0.219	0.251
	(0.203)	(0.194)	(0.171)	(0.171)
$Leverage$	0.255	0.202	0.224	0.18
	(0.239)	(0.2)	(0.205)	(0.178)
$CashHoldings$	0.129	0.14	0.143	0.18
	(0.168)	(0.174)	(0.161)	(0.183)
$Dividends$	0.084	0.097	0.168	0.135
	(13.85)	(3.724)	(0.408)	(0.508)
$InterestCoverag$	41.599	65.855	18.346	67.322
	(461.214)	(512.311)	(91.081)	(525.761)
$R\&DExpenses$	0.025	0.031	0.036	0.042
	(0.057)	(0.056)	(0.055)	(0.058)
$SellingandGenralExpenses$	0.222	0.224	0.253	0.263
	(0.319)	(0.175)	(0.177)	(0.183)
$AdvertisingExpenses$	0.011	0.015	0.017	0.015
	(0.037)	(0.04)	(0.044)	(0.038)
Observations	54623	20724	388	127

Standard errors in parentheses

Table 2.2: Multinomial Logit

This paper presents the results of the multinomial logit regressions with a three level categorical variable as the dependent variable. The categories are No turnover, Internal Turnover or External turnover. For each year the firm is assigned to one of this categories depending on the CEO status. The results indicate that the circumstances in which most CEOs leave office is not uncorrelated to the corporate finance variables of the firm, therefore indicating endogeneity on the decision. More specifically, the external turnover (turnovers in which the CEO came from a different firm) seems to represent a even more extreme situation. No turnover is used as the reference for the multinomial logit.

	External Turnovers	Internal Turnovers
VARIABLES	(1)	(2)
Market Leverage	0.582**	-0.0165
	(0.231)	(0.109)
Investment	1.062	0.130
	(0.899)	(0.372)
Return on Assets	-2.065***	-0.477
	(0.620)	(0.321)
Asset Growth	-0.952***	-0.822***
	(0.275)	(0.126)
Observations	20,996	
Industry FE	Yes	
Year FE	Yes	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Take away: This table shows Turnovers are in general a dramatic moment for the firm, and external turnovers (CEOs that are observed in two different firms, which we use to identify CEO FE) are even more dramatic. They are not happening for exogenous reasons.

Table 2.3: Reasons Previous CEO Left Office

This table presents the reasons why the exiting CEO on a external turnover (outside hire) is leaving the firm. The information is manually collected from Wall Street Journal articles.

Reasons	Occurrences
Stayed in company	110
Outside offer	14
Deceased	3
Illness	1
Retirement	106
Resigned	73
Forced out	62
Interim	3
Scandal	6
Belonged to turnaround consult	1
Unknown	40
Total	419

Table 2.4: Multinomial Logit

This table presents the results of the multinomial logit regressions with a three level categorical variable as the dependent variable. The categories are No turnover, Exogenous Turnover or Endogenous turnover. For each year the firm is assigned to one of this categories depending on the CEO status and the reason of the turnover. Exogenous turnovers are turnovers in which the CEO stayed in the company but in a different position, indicating that she was not forced out. The results indicate that our definition of exogenous turnovers is correctly selecting exogenous turnovers, because the changes in the corporate variable do not increase the probability of a "exogenous" turnover happening. Therefore, these turnovers appear not to be related to the underlying situation of the firm. No turnover is used as the reference for the multinomial logit.

Variables	Exogenous	Non - Exogenous
Book Leverage	-0.990	0.0715
	(1.340)	(0.102)
Investment	-6.452	0.268
	(7.855)	(0.351)
Returns on Assets	2.426	-0.755**
	(3.458)	(0.297)
Asset Growth	-1.090	-0.840***
	(1.496)	(0.118)
Observations	20,996	
Industry FE	Yes	
Year FE	Yes	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Take away: This table shows that the exogenous classification is doing a decent job selecting firms that are not undergoing a difficult time. It seems indeed that CEOs did not leave because of poor performance.

Table 2.5: CEO Impact on Performance - Returns on Assets

This table presents the results of the second stage regressions of performance variables. The variable $\hat{\mu}_{e'} - \hat{\mu}_e$ represents the difference between the estimated fixed effects of the new CEO and the old CEO obtained from the first stage regressions of the different variables from the exogenous turnovers. Panel A presents the impact on Returns on Assets and panel B on asset growth. The results show that the new CEOs do impact the both leverage and the cash holding policy, but do not impact on the dividends of the firm.

	All CEOs			Observed in 2 Firms			Exogenous		
	t-test	Bonf	Holms	t-test	Bonf	Holms	t-test	Bonf	Holms
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Investment Decisions									
Invest	78%	44%	46%	80%	40%	42%	82%	50%	54%
Panel B: Financing Decisions									
Mkt. Lev.	77%	52%	53%	74%	47%	47%	76%	46%	46%
Cash Holdings	66%	42%	43%	62%	36%	37%	67%	39%	39%
Dividends	19%	7%	7%	21%	9%	9%	20%	12%	12%
Int. Cov.	67%	8%	10%	69%	6%	6%	67%	1%	1%
Panel C: Operational Decisions									
R&D Exp.	60%	28%	30%	56%	27%	27%	63%	37%	38%
Adv. Exp.	45%	22%	23%	45%	22%	22%	37%	18%	18%
S&G Exp.	73%	42%	44%	71%	40%	40%	64%	40%	40%
Panel D: Performance									
ROA	77%	50%	51%	75%	46%	48%	76%	48%	49%
Asset Growth	85%	67%	69%	84%	65%	67%	80%	63%	64%
Num. of CEOs	2548	2548	2548	344	344	344	76	76	76

Take away: It is possible to run joint tests that are not subjected to the F-test criticism and find that a substantial number of CEOs reject the null that their fixed effect equals zero. This analysis allows us to exclude *Dividends*, *InterestCoverage* and *AdvertisingExpenses* as we find a weak evidence of CEO heterogeneity on this policies. The tests remain unchanged when we focus our attention to Exogenous turnovers, which reinforce the results for the next two tables.

Table 2.6: Changes in Corporate Policy at the year of Turnover

This table presents the results of the second stage regressions. The variable $\hat{\mu}_{e'} - \hat{\mu}_e$ represents the difference between the estimated fixed effects of the exiting and the incoming CEOs, obtained from the first stage regressions. *Exog* is an indicator of exogenous exits (Death, Illness and Natural Retirements). Each column presents the change in a different corporate policy. *Inv* are firm investments, *Lev* if Market Leverage, *Cash* are the firm's cash holdings, *R&D* are R&D expenses, *SGA* are Seeling and General Expenses, *ROA* are returns on assets and *AGrow* are assets growth. Panel A presents the results using the estimated fixed effects using all the observations for a given CEO. Panel B presents the results removing year t from the calculation to mitigate any mechanical relationship.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	*Inv*	*Lev*	*Cash*	*R&D*	*SGA*	*ROA*	*AGrow*
Panel A: Full Fixed Effect							
$(\mu_e - \mu_{e'})$	0.354***	0.474***	0.549***	0.797***	0.269***	0.687***	0.434***
	(5.371)	(8.840)	(6.009)	(3.471)	(3.131)	(4.938)	(9.627)
$(\mu_e - \mu_{e'}) * Exog$	0.114	-0.025	-0.318	0.982	0.003	0.201	-0.486***
	(0.837)	(-0.151)	(-1.633)	(1.029)	(0.018)	(0.636)	(-2.994)
Exog	-0.032***	-0.020*	0.004	-0.003	-0.004	0.006	-0.054**
	(-2.804)	(-1.784)	(0.302)	(-0.838)	(-0.769)	(0.948)	(-2.239)
R^2	0.0990	0.142	0.107	0.113	0.0429	0.139	0.383
Panel B: Fixed Effect excluding year t							
$(\mu_e - \mu_{e'})$	0.468***	0.427***	0.456***	0.744***	0.313***	0.609***	0.531***
	(7.712)	(11.739)	(7.803)	(7.745)	(3.799)	(8.610)	(14.327)
$(\mu_e - \mu_{e'}) * Exog$	-0.128	0.077	-0.127	0.685	-0.102	-0.341	-0.435**
	(-1.081)	(0.573)	(-0.687)	(0.894)	(-0.835)	(-1.625)	(-2.101)
Exog	-0.022**	-0.021**	0.003	0.001	-0.006	0.006	-0.044**
	(-2.215)	(-2.187)	(0.198)	(0.191)	(-1.252)	(0.775)	(-2.120)
R^2	0.112	0.157	0.117	0.160	0.0621	0.165	0.391
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	9,045	9,045	9,046	9,045	9,181	9,034	9,015
Gvkeys	1,263	1,263	1,262	1,263	1,279	1,262	1,259

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Take away: Firms that replace their CEO by another one with a very different characteristic present more pronounced changes in their policy at tje year of the turnover. This changes are insensitive to the inclusion of exogenous turnovers (except for asset growth), which indicate that the endogeneity is at the selection. Even firms in which CEOs exit for unforeseeable reasons carefully select their replacement.

Table 2.7: Average Changes in Corporate Policy in the First Three Years of New CEO

This table presents the results of the second stage regressions. The variable $\sum_{t==0}^{2}(\mu_e - \mu_{e'})$ is a vector of the sum of the differences in estimated, obtained from the first stage regressions of the different variables from the exogenous turnovers. This variable equals the difference between the estimated fixed effects in the first three years (Years 0 to 2) and zero otherwise. *Exog* is an indicator of exogenous exits (Death, Illness and Natural Retirements). Each column presents the change in a different corporate policy. *Inv* are firm investments, *Lev* if Market Leverage, *Cash* are the firm's cash holdings, *R&D* are R&D expenses, *SGA* are Seeling and General Expenses, *ROA* are returns on assets and *AGrow* are assets growth. Panel A presents the results using the estimated fixed effects using all the observations for a given CEO. Panel B presents the results removing year t from the calculation to mitigate any mechanical relationship.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Inv	Lev	Cash	R&D	SGA	ROA	A Grow
Panel A: Full Fixed Effect							
$\sum_{t==0}^{2}(\mu_e - \mu_{e'})$	0.295***	0.342***	0.331***	0.314***	0.207***	0.449***	0.430***
	(7.527)	(12.425)	(6.711)	(4.524)	(3.737)	(7.240)	(15.386)
$\sum_{t==0}^{2}(\mu_e - \mu_{e'}) * Exog$	0.076	-0.033	-0.031	0.218	0.100	-0.027	-0.089
	(0.903)	(-0.414)	(-0.312)	(1.101)	(1.307)	(-0.148)	(-0.779)
Exog	-0.006	0.001	-0.001	-0.001	0.003	0.000	-0.018
	(-0.765)	(0.098)	(-0.116)	(-0.625)	(1.126)	(0.119)	(-1.338)
R^2	0.102	0.146	0.107	0.0839	0.0500	0.135	0.392
Panel B: Fixed Effect excluding year t							
$\sum_{t==0}^{2}(\mu_e - \mu_{e'})$	0.231***	0.279***	0.277***	0.301***	0.231***	0.288***	0.407***
	(5.693)	(13.103)	(7.541)	(6.929)	(9.542)	(6.726)	(16.028)
$\sum_{t==0}^{2}(\mu_e - \mu_{e'}) * Exog$	0.048	0.016	-0.000	0.048	-0.020	-0.087	-0.194**
	(0.820)	(0.308)	(-0.002)	(0.245)	(-0.250)	(-0.687)	(-2.074)
Exog	-0.001	-0.001	-0.002	-0.001	-0.000	0.001	-0.015
	(-0.077)	(-0.158)	(-0.398)	(-0.850)	(-0.140)	(0.310)	(-1.160)
R^2	0.105	0.156	0.112	0.0977	0.0702	0.136	0.394
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	9,045	9,045	9,046	9,045	9,181	9,034	9,015
Gvkeys	1,263	1,263	1,262	1,263	1,279	1,262	1,259

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Take away: Similarly as Table 2.6, firms that replace their CEO by another one with a very different characteristic present more pronounced changes in their policy in the first three years of the new CEO. This changes are insensitive to the inclusion of exogenous turnovers (except for asset growth), which indicate that the endogeneity is at the selection. Even firms in which CEOs exit for unforeseeable reasons carefully select their replacement.

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